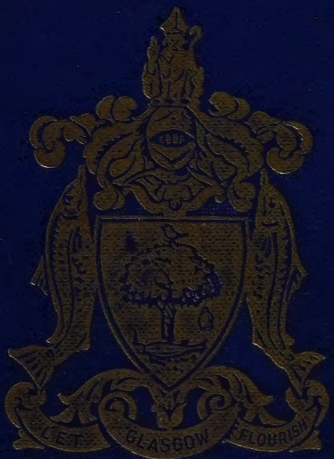
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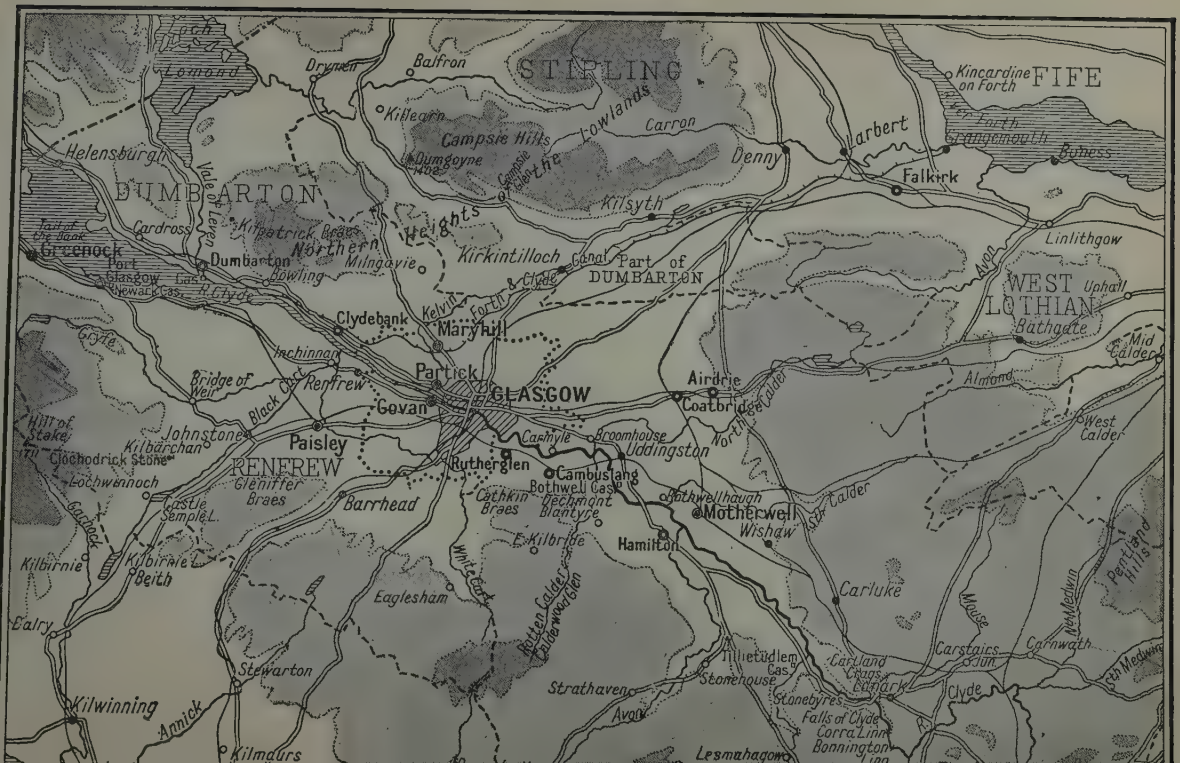
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DUMBARTON
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GLASGOW
RENFREW
Loch Lomond
Drymen
Balfron
Killearn
Campsie Hills
Lowlands
Carron
Kincardine on Forth
Grangemouth
Bo'ness
Larbert
Falkirk
Denny
Helensburgh
Vale of Leven
Kirkpatrick Braes
Northern Heights
Kilsyth
Cardross
Dumbarton
Milngavie
Kirkintilloch
Canal
Forth & Clyde
Linlithgow
Avon
Uphall
Greenock
Port Glasgow
Newark Cas.
Kilpatrick Hills
Bowling
Clydebank
Kelvin
Maryhill
Bathgate
Mid Calder
Inchinnan
Partick
Bridge of Weir
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Airdrie
Coatbridge
Almond
North Calder
West Calder
Hill of Stake
Johnstone
Black Cart
Paisley
Kilbarchan
Clochodrick Stone
Lochwinnoch
Castle Semple L.
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Barrhead
Gryffe
Rutherglen
Cambuslang
Bothwell Cas.
Cathkin Braes
Dechmont
Blantyre
Bothwellhaugh
Motherwell
Wishaw
Hamilton
E. Kilbride
Whitelee
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Clyde
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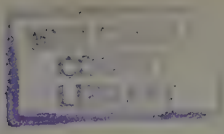


GLASGOW AND STRATHCLYDE

Chapter I

THE SITUATION OF GLASGOW

Our Own City

" Breathes there the man, with soul so dead,
Who never to himself hath said,
This is my own, my native land !
Whose heart hath ne'er within him burned,
As home his footsteps he hath turned,
From wandering on a foreign strand !
If such there be, go, mark him well ;
For him no minstrel raptures swell ;
High though his titles, proud his name,
Boundless his wealth as wish can claim ;
Despite those titles, power, and pelf,
The wretch, concentred all in self,
Living, shall forfeit fair renown,
And, doubly dying, shall go down
To the vile dust, from whence he sprung,
Unwept, unhonoured, and unsung."

THUS sang Sir Walter Scott in the first of his great romantic poems, *The Lay of the Last Minstrel,* and his lines find an echo in the breast of every true Scotsman. The Scots are probably the most far-flung race in the world, with the exception of the Jews, and yet they are the most patriotic, and the most fervent in love of their native land. This love was peculiarly strong in Sir Walter Scott, and one cause of this was that he knew his native land better than most men. If there are to-day many with souls dead to patriotism, the main cause of their

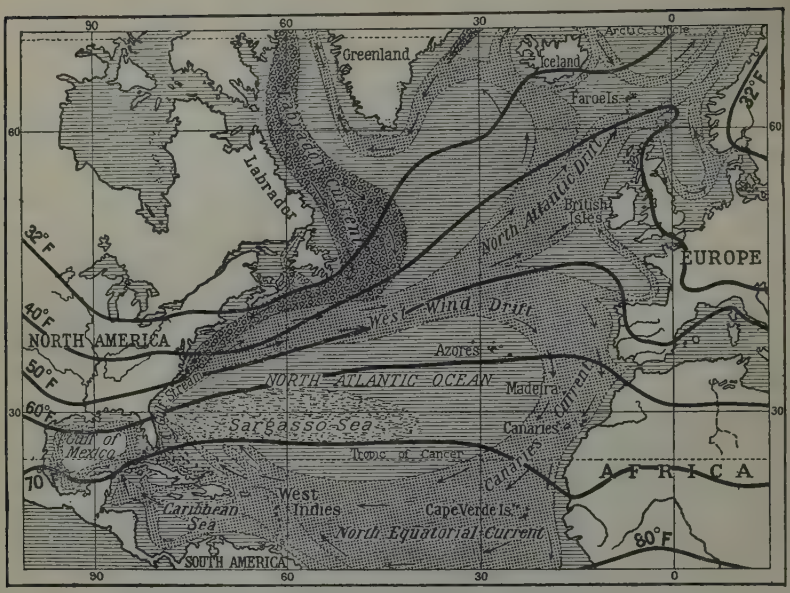
deadness is that they do not know their native land well enough ; love must be founded upon a real acquaintance with its object.

Love of country naturally begins with love of that part of it which we know best—our own home district. Sir Walter Scott was born and educated in Edinburgh, which he calls " Mine own romantic town." He was of Border ancestry, however, and in the Border Country he spent part of his boyhood and most of his later life ; he knew that district as few else knew it, and it was the Border that held the chief place in his heart. So ought it to be with every boy and girl who reads this book. Love of country to them should begin as love of Glasgow. The better they know their home-city the better they will love it ; the better also will they love Scotland for its sake. For Glasgow does not stand alone ; knowing the city means also knowing the country in which it holds so great a place.

Glasgow is your city. Just now that means that you belong to Glasgow. But a few years hence it will mean that Glasgow belongs to you. The greatness of your city is due to its people, who in past centuries worked and planned, not for their own benefit alone, but also to make their city a better place for others to live in. And your time will soon come. You will have to choose the men who will carry on all the work that is needed to make the city still better, and some of you will be chosen by your present schoolmates to manage the city affairs.

There is great need, therefore, that you should both know your city and love it. If you work only for your own benefit you will be of little use in the world. If you do not know the city and its needs, the plans which you make and try to carry out for it may be very far from wise. The knowledge and the love of your home city are both needed to make you a useful citizen. Without these you will be such as the poet describes in the lines we have quoted above.

MUNICIPAL BUILDINGS AND CENOTAPH, GLASGOW.
(*Photo: Valentine and Sons, Ltd.*)



North Atlantic Currents and January Temperature.

Geographical Conditions

When we speak of knowing any place, a town or a country, it is not really the place which interests us most, but the people. We want to know what kind of people they are, how they make a living and how they live, why that particular place was chosen by them or their forefathers to live in, and what changes they have made to improve it as a dwelling-place. We must know these and many other things about Glasgow before we can be said to know Glasgow at all. Why, for instance, do nearly one-fourth of all the people of Scotland live in Glasgow? Why are all the counties near Glasgow growing in population, while most of the others are decreasing?

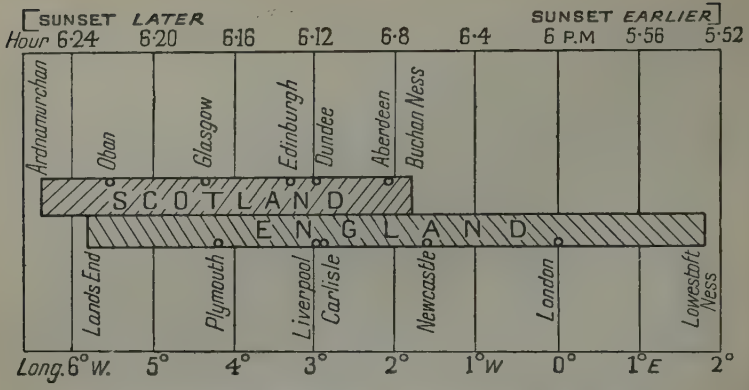
To find answers to these and many other questions about

Glasgow we must look in two directions—we must turn to its geography and to its history. The first will tell us the natural advantages and disadvantages of the place as a scene of human habitation. From the second we will learn how men have made use of the advantages, and how they have removed or modified the disadvantages, by dint of labour and skill.

In the matter of climate, Glasgow shares in the peculiar advantages which Britain derives from the mild winds and the warm currents of the Atlantic Ocean. Its latitude is nearly 56° north; that is to say, it is nearly 22°, or about 1,500 miles, nearer to the North Pole than it is to the Equator. There is no other place so far north which has so warm and mild a climate. Labrador, for example, in the same latitude, is snow-clad and its shores are frost-bound for more than half the year; only from June to September has it a temperature higher than we have in January.

Our northern latitude has an effect upon our period of daylight as compared with other places in the British Isles. In London, for example, the sun is above the horizon in winter nearly an hour longer; but on the other hand the twilight is much shorter: half an hour after sunset it is dark. In summer we have daylight an hour longer than London, and in addition our long twilight, which in the evening has scarcely faded away before the morning twilight begins; so that there is no darkness at all. Still farther north the difference is even greater. In the Orkney and Shetland midsummer one can take photographs or play a game of golf or of bowls at midnight.

Our longitude has also some effect in making our evenings longer. The map shows you that Scotland trends westward as well as northward from England. Leith, on the east coast, is actually farther west than Liverpool, on the west coast, while Ardnamurchan is farther west than Land's End. Glasgow itself is more than 4° west of Greenwich, and since every degree of longitude means four minutes' difference in time, our midday is really about seventeen minutes later than that of Greenwich. But our clocks are all set to Greenwich time,



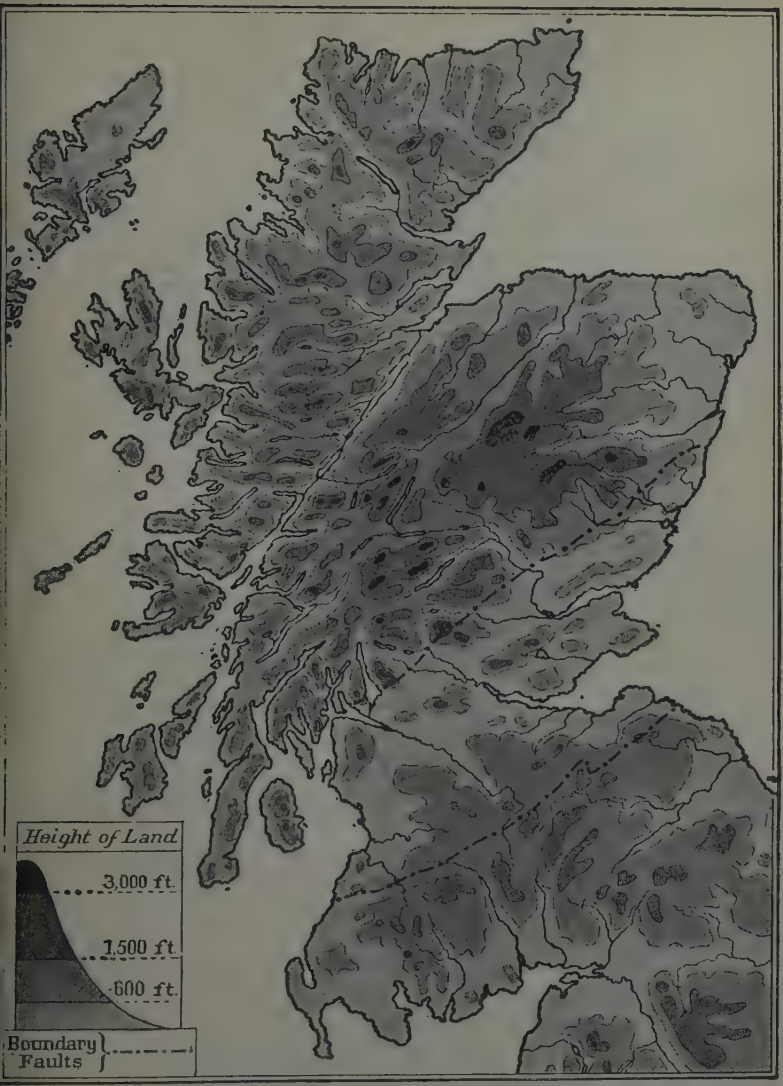
Westward trend of Scotland. Longitude and Local Time.

and so when the sun sets in London at six o'clock, it does not set in Glasgow till seventeen minutes past six.

The Midland Valley of Scotland

A good map of Great Britain coloured to show heights of land tells at once why Scotland has been called " the knuckle-end of England." England is on the whole a very flat country, most of its land being less than 500 feet above sea-level, and very little of it over 1,000 feet. Scotland, on the contrary, has very little land under 500 feet ; most of it is over 1,000 feet, and a large part over 2,000 feet above sea-level. Only one-sixth of the soil is suitable for ploughing ; one-half of the country is in pasture, nearly nine-tenths of which is hill pasture, very rough, and able to feed only the hardier breeds of sheep and cattle.

Setting aside the lowlands of Caithness and the Moray Firth in the north, and similar coastal plains round the Solway and the Tweed in the south, we see that nearly all the lowlands of Scotland lie between two parallel straight lines, the one drawn from Aberdeen or Stonehaven to Greenock, and the other, farther south, from Dunbar to Girvan. These lines

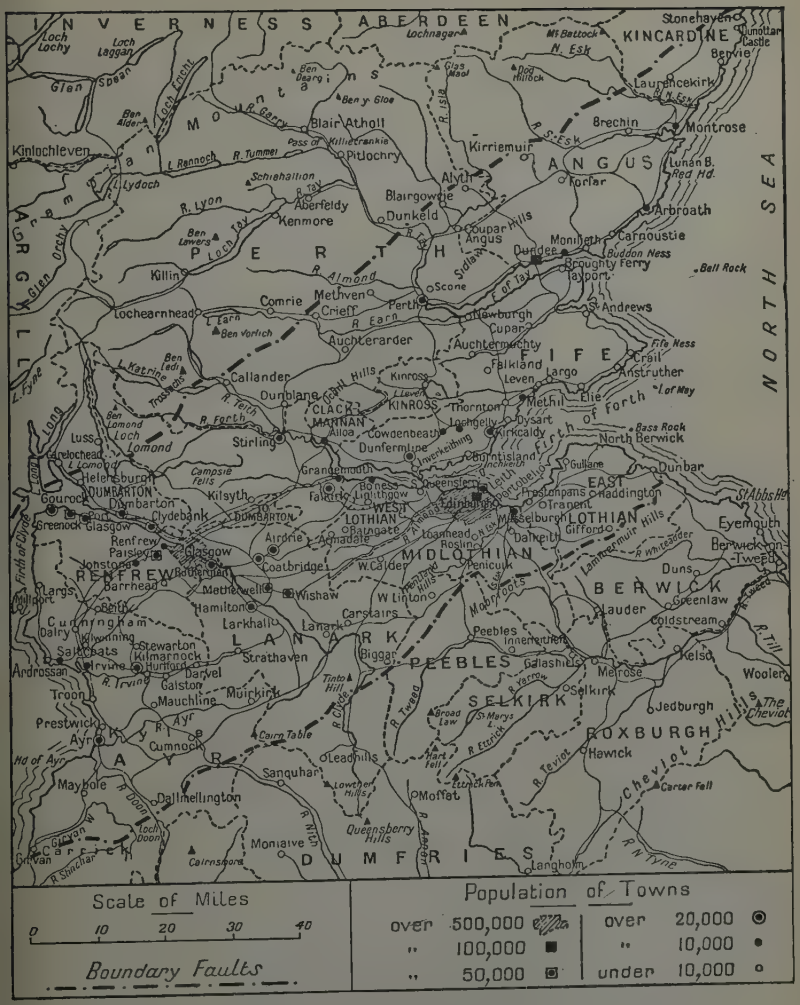


Orographical Map of Scotland. Contours at 250, 500, 1,000, and 2,000 feet.

are very important, for they are real natural boundaries, not artificial, as are the boundaries of many counties and countries.

The northern line represents a great fault or crack in the crust of the earth which separates the Highlands from the Lowlands. To the north of this line the rocks are grey slaty masses, very much twisted and crumpled up, while to the south of it we have the well-known white and red sandstones of which our towns are built, with seams of limestone and coal. Running through these, and often breaking up the surface, are masses of whinstone or trap, which give our Lowland hills their peculiar step-and-stair appearance. The southern line, from Dunbar to Girvan, though not so well marked, is again a fault or crack, forming the boundary between the lowland sandstones and the grey slaty rocks of the Lowthers and the Southern Uplands.

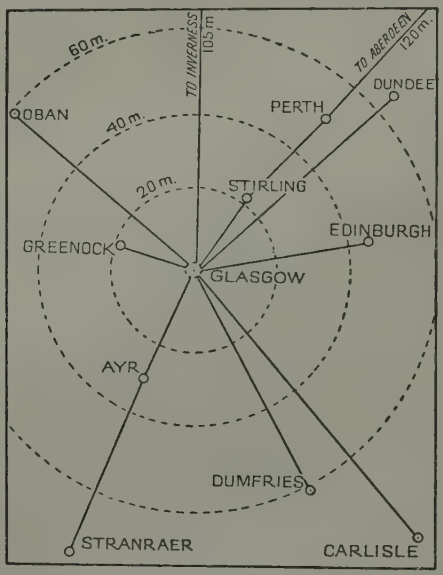
What is most important for us is that all the mineral wealth of Scotland, except slate and granite, lies between these two lines, in the great Midland Valley which stretches from the Firth of Tay to the Firth of Clyde—all the coal, ironstone, and oil shale, with all the big factories, and four millions of people out of Scotland's total of five. Further, the population is slowly but surely shifting into this valley, and every census shows increases here and losses almost everywhere else. Of the seventeen counties which are wholly or partly included within the Midland Valley, all but two showed an increase in population at the last census (1921); of the remaining sixteen counties all but one showed a decrease. Again, out of sixteen towns with over 30,000 people, Aberdeen is the only one which is outside of this belt, and that also lies near the edge of it. Of those sixteen towns, moreover, all except five are in the western half of the Midland Valley, with Glasgow as a centre, whilst this city alone accounts for over a million people, nearly one-fourth of all Scotland.



Towns in the Midland Valley.

Glasgow as a Centre

Taking Glasgow as a centre, we can make up a chart of distances which may serve as a useful scale when looking at a map. From Glasgow, Greenock is in round numbers 20 miles distant, Edinburgh is twice as far, Aberdeen 120 miles, Carlisle 80, and London 350. The width of Scotland from



Bowling to Grangemouth, the line of the Forth and Clyde Canal, is 30 miles, but from Glasgow to Grangemouth is only 24. The early trade of Britain was with the Continent of Europe, and hence Leith and Dundee were the principal ports. After 1700, however, trade with America rapidly increased, and this was the making of modern Glasgow, Greenock, and Dumbarton, ports which had before then been restricted to Irish and coasting traffic.

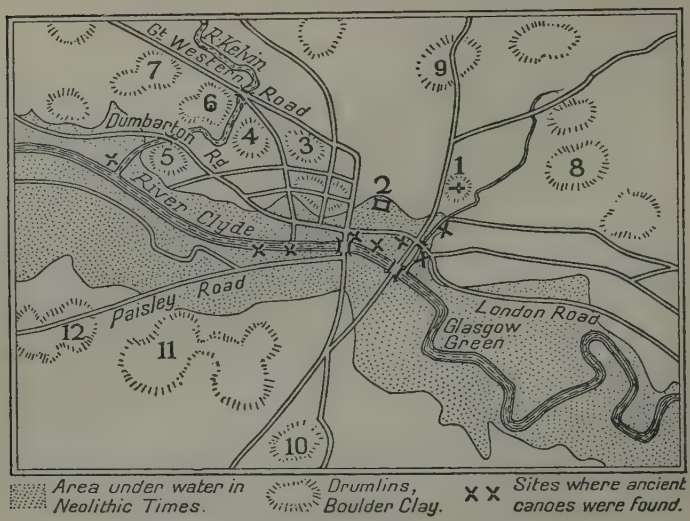
Hills of the Midland Valley

If we look again at the map of Scotland and study the surface of the Midland Valley we see that it is by no means a level plain, such as we may find in England and Ireland. In those countries there are many parts where you may look around you for twenty miles or more and not see a hill, but even in the most level parts of this valley, such as Glasgow or Falkirk, the hills are only a few miles away. In Glasgow, looking from the University tower, the flagstaff of the Queen's Park, Ruchill Park, or any elevated post, we see to the north a long line of hills: first, beginning with the Clyde at Dalmuir, we see the Kilpatrick Braes, and then, beyond the gap of the Blane Valley, the long line of the Campsie Hills, trending away to the north-east, where they are lost in the distance. On the map, however, they may be traced beyond the Forth, where they are called the Ochils, then again beyond the Tay, where they re-appear behind the Carse of Gowrie as the Sidlaw Hills, and finally die out behind Bervie and Stonehaven.

To the south of the Clyde the same ridge reappears in Renfrewshire, from Bridge of Weir to Largs. This line of hills is called the Northern Heights of the Lowlands, and is composed of a volcanic rock called andesite, a kind of whinstone.

If we look again from the Queen's Park, but to the south this time, the horizon is formed by another line of hills, much nearer and lower—the Cathkin Braes and Dechmont—then beyond the valley of the Cart the hills round Barrhead, and the Gleniffer Braes behind Paisley. These form part of a similar line of volcanic hills, the Southern Heights of the Lowlands, which stretches eastward across the country as far as the Pentlands and Arthur's Seat near Edinburgh, and in the south-west includes the hills round Tinto and the heights from Cairntable to the Carrick Hills and Girvan.

In addition to these two lines of Lowland heights the plain



The Site of Glasgow, showing "Drumlins."
(*After Professor Gregory.*)

1. Cathedral.
2. George Square.
3. Garnet Hill.
4. Park Circus.
5. York Hill.
6. University.
7. Observatory Hill.
8. Alexandra Park.
9. Cowlairs.
10. Queen's Park.
11. Pollokshields.
12. Ibrox.

around Glasgow is broken up by smaller masses, mounds, or ridges, called "drumlins," running generally along the "grain" of the country—that is, from north-east to south-west. These form the hills along the north of Glasgow—Garngad Hill, Cranstonhill, Gilmorehill, Dowanhill, and others—and on the south side Mount Florida, Camphill, and Haggs Bowes, and in Paisley, Castlehead and Oakshaw. Like most of our Scottish hills, these show rounded swelling outlines, and when cut into by a railway or for building, they are seen to be made of clay packed full of stones, commonly called boulder clay, of which we shall hear again later.

Chapter II

STRATHCLYDE

The Clyde Basin

THE only British rivers of any size flowing to the west coast are the Clyde and the Severn. The Clyde gets its name from a Celtic word which is found also in the form *Clutha* and in the Welsh river names *Clwyd* and *Clydach*. It is 100 miles long, and its real head-water is the Daer (*Dawr*), which rises on the northern slope of Nutberry Hill, between the shires of Lanark and Dumfries. It takes its name, however, from a smaller stream which flows in from the east above Elvanfoot, called Clyde's Burn, and this accounts for the old rhyme :

> " Annan, Tweed, and Clyde
> Sprang frae ae hill-side ;
> Tweed ran, Annan wan,
> Clyde fell and brak its neck ower Cora Linn."

These three rivers all rise in the hills to the north of Moffat, within three miles of one another, and the Annan, being the shortest of the three, wins the race to the sea.

In the first part of its course the Clyde flows through the Southern Uplands ; the rounded hills, treeless but green to the top, are the feeding-ground of countless sheep, and are composed of grey, slaty rocks covered with the usual coating of glacial drift. At Symington the river leaves those uplands, makes a big bend round Tinto, a volcanic mass in the southern line of heights, and at Lanark cuts its way through a gorge of Old Red Sandstone, forming the famous falls of Bonnington, Cora Linn, and Stonebyres. From Lanark to Hamilton it

runs through a sheltered valley, and it is here that we find the famous orchards, planted first by the Romans, some say, which have given to this district the title, "the Garden of Scotland." It is interesting to note that the same combination of volcanic rock and red sandstone in the Midland Valley occurs also at Blairgowrie in Strathmore and in the Carse of Gowrie, the other great fruit district of Scotland.

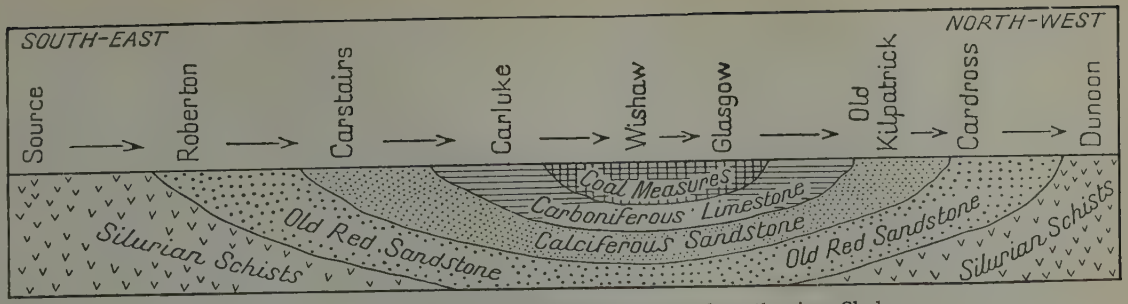
The Clyde is now passing through the great Lanarkshire coalfield, though its deep groove hides from it most of the coalpits, but it finally cuts through the sandstone at Bothwell Castle and comes into the open at Uddingston. From this point its course is very level and marked by many windings, till on arriving at Glasgow it is tamed, straightened and deepened, and made into what is practically a ship canal. Lastly, at Cardross and Greenock, in the northern line of heights, the red sandstones appear again, while across the Firth at Kirn and Dunoon we have the grey slaty rocks of the Highlands beyond the northern boundary fault. Although the Clyde is running downhill all the time, its course thus lies across a basin of rocks which may be shown diagrammatically as in the section on page 26. A cross-cut from north to south through Glasgow shows the same basin structure. The total fall of the Clyde from source to sea is roughly 2,000 feet, and of this the Falls of Clyde account for 350 feet.

Tributaries and Routes

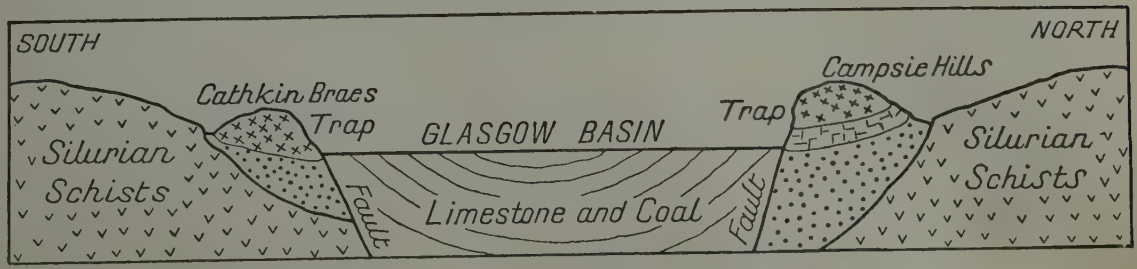
In the upper part of its course the Clyde receives many tributaries, which drain the extensive sheep-farms of the Southern Uplands. The valley of its head-water, the Daer, eleven miles long, affords no thoroughfare, and the main road into Clydesdale from the south comes up the Annan, leaves this river at Beattock, and follows the valley of the Evan up to Beattock Summit, 1,000 feet above sea-level, striking the Clyde at Elvanfoot. The old Roman road, which was in regular use till Telford made the present road in 1816, kept to the Annan Valley from Moffat till past the Beef-Tub, then

CORA LINN.

(*Photo: Valentine and Sons, Ltd.*)



Diagrammatic section showing succession of rocks along the river Clyde.



Diagrammatic section of rock strata across the Glasgow Basin.

struck north-west over the Errickstane Pass and entered Clydesdale at the Roman Camp near Little Clyde Farm, where Clyde's Burn comes in from the east and gives its name to the greater stream. Another Roman road branched off at Elvanfoot, following the line of the present Dumfries road, but ascended the Powtrail by the Well Path into Durisdeer, and so into Nithsdale. The present road goes down the famous pass of Dalveen, the "Lang Glen" of Burns, and follows the Carron Water to Carronbridge and the Nith. Elvanfoot is the parting of another road, this time going up the Elvan to "God's Treasure-House in Scotland," the gold-bearing district of Leadhills and Wanlockhead, and then down the picturesque Mennock Pass to reach the Nith below Sanquhar. Another route to Leadhills and Nithsdale is afforded by the valley of the Glengonner Water at Abington; the water coming down from Leadhills is sadly discoloured by lead washings. The next tributary stream of any consequence is the Duneaton, nineteen miles long, which again gives a connection to Nithsdale by Crawfordjohn and Crawick Water.

At Symington a very level valley opens to the east, drained by the Biggar Water, which is practically a canal, and in heavy floods presents the unusual feature of flowing both ways. At the western end its waters run into the Clyde, but at Broughton, twelve miles to the east, they flow into the Tweed. It is by this route that salmon manage to reach the upper Clyde, because, apart from the pollution of the river near Glasgow, it would be impossible for them to leap the Falls. Through this valley the road and railway run to Biggar, Peebles, and Tweedside. A similar level stretch at Carstairs, drained into the Clyde by the North and South Medwins, gives an easy approach to Edinburgh by Dunsyre, West Linton, and Penicuik on the south side of the Pentlands, and by another less populous route on the north side, the line followed by the railway.

Just above the Falls of Clyde there comes in from the west a stream with a historic name, the Douglas, twenty miles

long, and this provides the first cross route between Lanarkshire and Ayrshire—up the Douglas and down the Ayr, passing through the southern strip of the great coalfield, and showing coalpits at Douglas and iron-works at Muirkirk. This cross valley carries the railway line from Edinburgh to Ayr by Lanark, and taps such interesting places as Douglasdale and the Burns Country, with Ballochmyle and Mauchline. At Lanark the Mouse Water enters the Clyde from the east, cutting its way through the Cartland Crags, the scene of Wallace's early exploits.

When the Clyde emerges from the Old Red Sandstone gorge at the lowest of the falls it enters the great industrial district of Scotland included in the Lanarkshire coalfield, dotted at first with coal-pits and then with steel-works, and covered with towns which by-and-by become almost continuous. The actual course of the river is through orchards and fruit farms, the garden of Scotland from Roman times, lying well below the general level of the county and consequently mild and sheltered. It is one of the sights of Clydesdale to see in spring the " white flourish " of the cherries and plums, followed by the " red flourish " of the apple-trees, while in midsummer the air is heavy with the scent of strawberries. Carluke is the main centre of the preserve trade in this part of Scotland. Near Crossford the deep glen of the Nethan, with its castle, the " Tillietudlem " of Scott's *Old Mortality*, is a well-known beauty spot. Although we are now in the Scottish " black country " it is very different from the black country of England ; not all the unsightly bings and squalid rows can hide the natural beauty of the scenery which the river shares with its tributary streams from Lanark to Uddingston.

At Hamilton, the Avon, twenty-four and a half miles long, enters from the west, providing the second great cross route from Lanarkshire to Ayrshire, by Stonehouse and Strathaven, past the battlefields of Drumclog and Loudon Hill to the Irvine valley at Darvel, and so by Newmilns and Galston to Kilmarnock and the sea. The three Calders near Uddingston

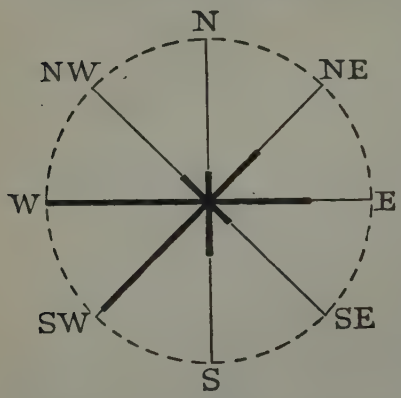
all justify their name, which means a hazel-fringed stream. On the west side the Rotten Calder from East Kilbride passes through Calderwood Glen, a popular holiday resort, sadly shorn of its woods by the war ; the South Calder near Motherwell passes under a so-called " Roman " bridge at Bothwellhaugh, on the line of the Roman road from Carlisle to Dumbarton ; and at Broomhouse the North Calder, sixteen miles long, coming from Airdrie, gives routes for road and railway to that town, and eastward to Bathgate and Edinburgh. At Partick the Kelvin emerges from Kelvingrove, coming from beyond Kilsyth, twenty-one miles away, and flowing through what was once a glacial valley between Forth and Clyde, and is still traversed by a canal which may one day become a real ship canal from sea to sea. The Kelvin also receives the streams from Campsie Glen and the Blane Valley, that deep notch in the landscape to the west of the cone of Dumgoyne which gives Glasgow a peep at Ben Lomond and the Highlands from the Trossachs to Arrochar. At Inchinnan, beyond Renfrew, the Clyde receives its last tributary on the left bank, the river Cart, nineteen and a half miles in length, receiving the Gryfe from west Renfrewshire, the Black Cart from an old glacial valley occupied by Kilbirnie and Lochwinnoch Lochs, and the White Cart from Eaglesham passing through a region now rapidly becoming one of Glasgow's suburbs. The last feeder of the Clyde is the Leven, entering at Dumbarton, a short and level stream carrying the overflow of Loch Lomond. From Dumbarton to the loch is little more than five miles, as the crow flies, and as Loch Lomond is only twenty-three feet above sea-level a very slight sinking of the land would turn it once more into a sea loch, as it undoubtedly was when the first Britons arrived on the scene.

The tide flows up the Clyde as far as the weir at Carmyle, and from this point down to Newark Castle at Port-Glasgow the river is regulated by the Clyde Trustees, and forms the Port of Glasgow. The Clyde has no sand-bar at its mouth, nor does it form a delta of the usual shape ; its deposits are laid down at the sides, chiefly on the northern shore, and in

the centre a channel for shipping is maintained by dredging till deep water is reached at the Tail of the Bank, opposite Greenock.

Climate of Strathclyde

Our prevailing winds are from the south-west, coming warm and moisture-laden from the Atlantic. The rainfall therefore is greatest in the west, and steadily decreases towards the east; Fort William has a fall of 80 inches or more per annum, Greenock 60, Glasgow 40, and Uddingston 30. It increases again as we ascend the Clyde Valley and reach the high ground, becoming 60 inches once more at Leadhills and the Summit. Our wettest months are December and January, and our driest are March and April. January is our coldest month, and August, or occasionally July, is our warmest. August is also our healthiest month, as people are then reaping the benefits of the fresh air and sunshine of the Fair holidays, while our cooler climate saves us from the scourge of the summer diseases which then carry off so many infants in England.



Wind star, showing relative frequency of winds in Glasgow.

From these and similar causes the mildest residences for invalids in winter are to be found in the area of the Firth of Clyde, at such places as Helensburgh, Bute, the northern coast of Ayrshire, and certain parts of Arran. In these districts the rainfall is not heavy, and the winter temperature is higher than in any of the eastern parts of Great Britain, and compares with that of the south coast of England. It is this combination which has procured for Rothesay the name

of "The Madeira of Scotland." Grapes have been grown in the open air at Hunterston, near West Kilbride, the wild fuchsia flourishes all over Arran, and Campbeltown can dispute with Jericho the title, "the city of palm trees." On the other hand, cool and enjoyable summer residences are to be found in Upper Clydesdale, at such places as Biggar, Lanark, Crawford, and Elvanfoot, the first two of which dispute with Uddingston the distinction of being the driest towns in Lanarkshire, having a rainfall of 30 inches or less. Our British climate has been a long-standing subject of abuse, yet there is no country in the world where one can spend in the open air more hours in the day or more months in the year, and Richard Jefferies long ago pointed out that birds which have a continental choice of climate frequent the British Isles in greatest numbers.

Drift and Boulder Clay

Any visitor to Scotland who has an eye for landscape is struck by the smooth, sloping outlines of most of our hills. There are no sharp peaks, curious pinnacles, or awesome precipices such as may be seen even in the English Lake District, to say nothing of the Alps; on the contrary, the hills are like great waves of a land sea, easy of ascent, and green to the top, and where their structure is exposed by rain-gullies or railway cuttings they are seen to be covered to the depth of many feet with loose sandy rubbish called "drift," or with a tough boulder-clay containing fully half its bulk of stones. The view of Arran from, say, West Kilbride shows the two types of hill; on the north the craggy peaks of Goatfell and the Castles, and on the south the gently undulating hill masses which fall to the Sound of Pladda.

The widely-spread covering of boulder-clay has been cut through in many places in making railways and docks, in opening quarries, and in house-building, and by this means some curious observations have been made. The stones with which the clay is crammed are of all sizes and kinds,

but they are all rounded like those on the sea-shore, and in about one-third of them their structure shows that they have come from considerable distances, in some cases at least fifty miles. When this surface covering has been cleared away, the solid rock below is always found to be polished and scratched in parallel lines, and these lines run in the same direction over many miles of country, showing that the same graving tool has been at work over a very wide area. Lastly, on certain exposed surfaces we find huge blocks of stone, not belonging to the district, but coming from places a score of miles away, from which they have evidently been carried there and dropped. One of these is " Queen Mary's Seat " in the Cathkin Park, and another is in Clochodrick between Kilbarchan and Lochwinnoch. The question naturally arises, What carried them ? There is only one agent which is known to produce all these effects, and that agent is Ice.

The Glacial Periods

We speak of the restless, ever-changing sea, and of *terra firma*, the solid earth, but increase of knowledge has shown that it is the sea which is constant and the earth which changes. The words of Tennyson are literally true :

" There rolls the deep where grew the tree,
O earth, what changes hast thou seen !
There, where the long street roars, hath been
The stillness of the central sea.

The hills are shadows, and they flow
From form to form, and nothing stands ;
They melt like mist, the solid lands,
Like clouds they shape themselves and go."

Let us try to picture the state of matters before man appeared in Scotland. The whole country was much higher, the British Isles were joined to one another and to the Continent, and the western shore of Europe stretched far west into the Atlantic. Then the land sank and the climate grew

Sketch of the direction of ice-flow in Central and Southern Scotland.

colder ; tropical animals such as the lion were killed out or retired farther south, and as the cold increased even the cave bear and the woolly rhinoceros died out. Finally, the whole country was wrapped in ice as Greenland is to-day, and great glaciers, larger than any in the modern Alps and thousands of feet thick, swept down from Lorn and Lochaber, grinding down the hills in their passage, cutting deep troughs in the sea-lochs of the Firth of Clyde, and finding the Firth itself too narrow for an outlet, so that a great portion of them turned south-east at Gourock and swept over Renfrewshire and Lanarkshire. It was this portion which cut Dumbarton Rock in two and rounded the remainder, which blocked the Clyde near Bowling so that the river had to reach the sea by Kilbirnie and Lochwinnoch, and at another stage by the Barrhead gap and Lochlibo, and possibly also to the north-east by Kilsyth ; and it was again this branch of the great ice-field which rounded off the Cathkin and Kilpatrick Braes,

and as it melted left behind those widely spread deposits known as drift and boulder-clay.

After the Glacial Periods

When the glacial periods came to an end the land had sunk a hundred feet below its present level; the Firth of Forth, instead of stopping at Alloa, extended away behind the Campsie Hills as far as Aberfoyle, and the Firth of Clyde formed a land-locked gulf from Bowling to Uddingston, covering the whole of what is now the south side of Glasgow and bounded on the north by the line of hills which fall to George Street. Think of the ancient sea-bed, now Argyle Street—

> "There, where the long street roars, hath been
> The stillness of the central sea."

Then the land rose again and the climate improved, not continuously but by steps and spurts. At 75 feet there was a pause, the traces of which are still to be seen in the terraces found at that level to-day. Another pause took place at 50 feet, but the best-marked pause of all was when the land was only 25 feet below its present level. The 25-feet beach of this ancient time is a well-marked feature of our coast, and most of the towns on the Firth of Clyde are built on it. The ancient sea-cliffs and caves are very well seen in places which have not been disturbed by building operations, such as the western shore of Arran from Lochranza to Pirnmill, and to this stage a peculiar interest attaches, for it was then that man first appeared in our district.

By that time the glaciers had so far retired as to occupy only the higher hills, and they had left behind them the results of their grinding passage in the form of masses of boulder-clay. These, by the actions of tides and streams, had already been cut into those isolated knolls or "drumlins" which make Glasgow a city of far more than seven hills, and form two parallel lines from Stepps to Scotstounhill on the

north and from Mount Florida to the Castlehead of Paisley on the south. The climate was still cold, and the great hairy elephant called the mammoth was still living in the district, for remains of eight of them were found in a single quarry near Kilmaurs, and other relics have been got elsewhere in lower Clydesdale. Now the mammoth has long been extinct, but one of the earliest works of human art is a very faithful drawing of the beast made by a man who must have seen it alive. Glasgow is thus among the very earliest prehistoric settlements in Scotland, and it has often been claimed as the oldest Scottish town, going back to the Neolithic or Newer Stone Age, some thousands of years before the Christian era.

An engraving of a Mammoth on an ivory tusk found in the Dordogne Caves, France.

Chapter III

THE VANISHED RACES

The Old Stone Age

THE written history of the British Isles begins with the Romans, but the centuries before their coming have left a great wealth of unwritten history, which can be read by those who have eyes to see. In Britain, as in Europe generally, early man seems to have been a hunter and fisher, living in caves which he often adorned with drawings. His tools and weapons were made of stone, especially flints, which he chipped so as to get a cutting edge or a point for boring, and this stage of his history is therefore known as the Old Stone Age. In a sense we may say the stone age still continues among us ; little girls playing at " shops " use a hard pebble of quartzite or whinstone as a hammer, and with this they pound softer sandstones into powder, red, yellow, and white, and so form their stock-in-trade of peasemeal and oatmeal, sugar and coffee.

After the Great Ice Age, as the climate grew milder the melting glaciers formed torrential rivers, such as are seen in Switzerland to-day, and these scooped out the mounds of glacial rubbish into separate hillocks and ridges, pretty much as they are now. At the same time the land was rising so that the British Isles were joined to Europe, and the country was covered with woods and pastures, giving food to grass-eating animals of all sorts. These in their turn attracted hosts of flesh-eating animals, such as the bear, lion, and hyena, and even many sub-tropical animals such as the hippopotamus, cave-bear, and sabre-toothed tiger. Then the climate again became colder, causing these last-named

creatures to retreat to the Continent or to die out, and the early men who were then in existence had to be content with smaller fare, moving northward to follow the reindeer, and in some cases having to live on shellfish.

The New Stone Age: First Settlers

With increasing cold the land sank again, forming great inland seas. At this time animals which are now extinct all died out, except such northern forms as the reindeer, the Irish elk, and the wild bull. To the west of Stirling the skull of a whale was found many feet below the present surface, evidently a stranded whale of the time when the Firth of Forth stretched westward to Aberfoyle, and lying on the bone was a pick of stag-horn with a wooden handle. When the land had sunk to about 100 feet below its present level it began to rise again, and when it was from 25 to 30 feet below the present level men again appeared—the men of the New Stone Age. These men have left abundant traces all along Clydeside. Their tools and weapons were still made of stone—not now rudely chipped, however, but rounded and polished to serve their purposes, and so we have numerous spear-points, lances, javelins, harpoons, and arrow-heads, as well as awls, axes, hammers, and chisels, often with handles of horn.

These men of the New Stone Age were more civilized than their forerunners. They were still hunters and fishers, but they had learned to tame and use the ox, horse, sheep, goat, and pig, and even kept dogs as pets. They had also learned the use of vegetable food, and grew wheat, oats, and barley, as well as various fruits. They made pottery and ornamented it, and they could spin and weave and make garments of cloth and leather. Ornaments they had in plenty: native gold, beads, necklaces, bracelets, rings, and pendants, and even buttons and pins, these last made generally of bones, especially fish-bones. Besides bone, they used jet, amber, shells, and the teeth of animals taken in the hunt. Moreover,

PREHISTORIC CANOE FOUND AT LOCHWINNOCH.

(Photo: George Outram and Co., Ltd.)

they were no longer content to live in caves, but built houses of stone slabs, and not only for the living but for the dead. They believed in a future life much like the present, and so they buried with the dead man all those weapons and tools which he was most likely to require over there, and it is indeed from such deposits in their tombs that most of our information regarding life in ancient Clydesdale has been derived. One curious difference has been observed: unlike the earlier cave-men, they were not artists. Perhaps with so many fresh activities demanding attention, they had less leisure time than the cave-men had when game was scarce and the winter evenings were long.

Prehistoric Canoes *

In the Glasgow district the men of this age appear to have been an industrious colony of fishers. Over a score of canoes have been found as high as ninety feet above the present sea-level, and at a considerable distance from the present bed of the Clyde—in one case, three-quarters of a mile. Eight of these canoes were found lying together, evidently sunk in harbour during a storm or perhaps in an ancient sea-fight. One was found below London Street, near Glasgow Cross, in a vertical position, bow uppermost, and its inside was full of sand and shells, while mussels and whelks were still clinging to the wood, showing that it had sunk in sea-water. One canoe is to be seen in the Hunterian Museum of Glasgow University, and shows the ancient method of boat-building. Instead of being made of separate planks, clinker-built, like modern boats, these canoes were formed of the trunk of a tree, hollowed out by fire to begin with, and finished off with stone axes. The bow was upturned, like the boats of Shetland and Norway, and the stern was formed by a flat board shaped to fit the hollow and fitted into a groove. Paddles seem to have been used instead of oars, although one canoe had what

* See map on page 22.

looked like holes for thole-pins, but sails were apparently not known. The Clyde at that time was a broad and shallow salt-water lagoon like what is seen at Venice, extending from Uddingston or Carmyle to the narrows at Erskine, and from the foot of the Cathkin Braes to where the first ridge rises above George Street in the present city. Many other articles have been found in this area—paddles, stone sinkers for fishing lines, large grooved stones which may have been anchors, tools of all sorts which had dropped overboard, bones of whales and of great fishes no longer found within thirty miles of the district, skulls, bones, and horns of the extinct Irish elk, the wild ox, and the reindeer, and trunks of trees which show that they had drifted about in the sea a long time, until they had become water-logged, and had finally sunk.

Stone Monuments

To the north of Glasgow, on Craigmaddy Moor, there stand three great stones, two on the ground and the third on the top of these, known as "the Auld Wives' Lifts." The legend is that three witches were competing in a trial of strength; the first carried a huge block and placed it in position, the second carried a still bigger one, but the third won the prize by lifting her block, the biggest of them all, and placing it on the top of the other two. A great deal of discussion has raged around the Auld Wives' Lifts, as to whether they are natural rocks split by ordinary weathering, or genuine human monuments—a Druid altar or something of the kind. If recent discoveries are confirmed, the markings on these and similar stones in the Clyde area will show that these men of the New Stone Age, or at any rate their leaders, were by no means the ignorant savages which our forefathers imagined them to be. On the contrary, their Druids, or wise men, had a knowledge of surveying and measurement which is quite creditable, and had advanced in astronomy so far as to predict eclipses, like the astronomers of ancient Egypt and Babylon.

Lake Dwellings

These early ancestors of ours have left another evidence of their manner of life in the form of lake-dwellings, or crannogs, as they are generally called. These were specially designed for refuge and protection in troublous times, and took the form of an artificial island constructed in the shallow part of some lake, separated from the shore by deeper water and sufficiently removed to be out of range of the primitive weapons of that time. Two methods seem to have been employed in making these lake-dwellings. One of these is still followed by native races in all swampy countries, or in districts liable to floods, from Japan to South America, and that is to drive wooden piles into the bottom of the lake at the site selected, and to place on these a horizontal platform of timber. On this the wooden houses are then built, and sometimes turf and soil are added so as to make vegetable gardens, for some of these lake-villages are large enough to contain two or three hundred inhabitants. Very often a paling of stakes or brushwood was formed round the edge, and communication with the shore was maintained either by boat or by a gangway of planks which could be withdrawn at night. This is, in fact, the principle of the mediæval fortress with its moat and drawbridge, only in the latter case the water was brought to the stronghold instead of the stronghold being built on the water. In many parts of Scotland, where large timber was scarce, a different method was adopted. A large raft was made in some shallow place and then filled up with stones and earth till the whole sank ; more stones and earth were then added until a real island was formed. In many settlements of this sort, access to the shore was provided by means of a submerged causeway, narrow and with several turns, so that while the inhabitants themselves, who knew the way, could easily wade across, a hostile stranger—and in those days every stranger was a possible enemy—would be sure to go off the track and slip into deep water. Such places of refuge could be reached by enemies only in

boats or by swimming, and in the latter case only by a surprise attack.

These crannogs are fairly common in southern Scotland and Ireland, and all except four are in fresh-water lakes, one of these four having been discovered in 1898 at Dumbuck, between Bowling and Dumbarton. Two crannogs were discovered in Bute, one in the Dhu Loch and the other in Loch Quien, and over fifty have been found in Southern Scotland, more than half of them in Strathclyde. None have been found in districts colonized by Angles; only half a dozen in the south-west of Scotland, the region occupied by the Scots from Ireland; and about a dozen in the northern portion, the land of the Picts. These facts, together with the evidence from the similar dwellings found in the Lake of Zürich in Switzerland, indicate that the founders of these lake dwellings were a Celtic people, mainly pastoral in their habits rather than hunters, who brought with them from the east their domesticated animals. In Switzerland their greatest development was reached about 1500 B.C., but they persisted down to Roman times, and the pottery and tools found in them extend over the Stone, Bronze, and Iron Ages. In Scotland the crannogs were occupied in much later times, and indeed seem to have served as havens of refuge to the Britons of Strathclyde in the very troublous times which followed the withdrawal of the Romans.

It is interesting to observe that the trees used in these crannogs are larger than those which are now found in the district, especially in the case of oaks, which do not flourish to any great extent in Scotland to-day. This leads us to suppose that our climate was much milder than it now is, and this conclusion is supported by Julius Cæsar, who says that Britain had a climate more temperate than that of Gaul or France, and by Tacitus, a century later, who mentions that the climate of Scotland was damp and overcast, but without intense cold. Trees have long since vanished from many of the places where these crannogs are found, but their stumps are found buried in peat-bogs fifteen or twenty feet deep, and

such place-names as Pollokshaws, Shawfield, Oakshaw (*shaw* meaning a wood), and Woodside, Linwood, and Howwood, all show that down to comparatively recent times—even the time of our Scottish Queen Mary—great tracts of Scotland were still covered by the Caledonian forest. The prevalence of extensive swamps and marshes in Roman times and later is shown by place-names in *pol-*, a pool or marsh, like Polmadie, Pollokshaws, Polmont, Pollokshields ; in *haugh*, a riverside meadow subject to floods, as in Kelvinhaugh, Parson's Haugh ; and in *inch*, an island, still seen in Whiteinch, Abbotsinch, Inchinnan, and many others. These all point to a time when the Clyde was much broader and shallower than it is to-day and regularly overflowed into lagoons, a state of matters which continued very nearly down to the year 1800.

Earth Houses

The early men of Clydesdale have also left relics of their home life in the form of earth-houses or weems (*weem* meaning a cave), and in such place-names as Weem near Aberfeldy, Wemyss in Fife, and Wemyss Bay on the Firth of Clyde. These dwellings were wholly or partly underground, lined and paved with flag-stones, and roofed in beehive style with over-lapping courses of flat stones, the whole being covered with earth and turf after the fashion of the ancient burial mounds. In 1808, when a quarry was being opened at Overlee near Cathcart, the workmen came upon a regular village of this sort, no fewer than forty-two such dwellings being laid bare. They were partly dug out and partly built up, and were single apartments from eight to twelve feet square, and four or five feet high. They were paved with small flat stones, and lined with larger flag-stones, but the roof had fallen in, covering the floors to a depth of about a foot with vegetable mould. In the centre of each floor was a hollow which did duty for a fireplace, and in many of these ashes and cinders were found, including cinders of coal. It so happens that the gorge of the river Cart here, like that of

the Avon at Hamilton, shows outcrops of coal, and it is natural to suppose that these ancient people set the example, which their modern descendants have often followed during coal strikes, of picking by hand the surface seams exposed in these river channels. Similar dwellings have also been found in Baldernock, on the north side of the Clyde, and many of these show evidences of being of a fairly late date, coming down even to Roman times. The ordinary houses were more flimsy structures, made of turf and wattle, and these, of course, have left no traces. Such houses were in common use in the time of Kentigern and Columba, a century and a half after the departure of the Romans, and persisted in Clydesdale till the twelfth century, and in such out-lying districts as the Hebrides down even to the nineteenth century.

The Mediterranean Race

Who were these people, and where did they come from? The question is interesting, because it would seem that we are their direct descendants, making allowance for admixture of races by streams of conquest and immigration. It should be mentioned here that the shape of the skull is of great importance as a mark of race, some races being classed as "long-headed" and others as "broad-headed." The meaning of "long" and "broad" may require explanation; the *length* of the skull is the measurement from front to back, looking down on the top of the head, and its *breadth* is the measurement across, or from side to side. The length is always greater than the breadth, but in the broad or round types the difference is less than in long-headed races.

The evidence goes to show that there were two main streams of immigration at the close of the glacial period. First came a race of average height, with dark hair and complexion and long-shaped heads and faces. These Long-heads, as we may call them, have been traced from the south-east of Europe, along the line of the Mediterranean, to Spain and France. Here the current of migration divided, one branch

swerving northwards through Belgium up to the shores of the Baltic, and another crossing to England, then to Wales and Ireland, and thence to Scotland, where they colonized at first the south-western districts. These Mediterranean men, as they are now called, are distinguished by the chambers they built for their dead, much more elaborate than the houses of the living, showing a belief that the next world was more important than the present, both for condition and company. At first the dead were simply buried in the earth, but later on the burial trench was lined and roofed with stone slabs, and divided into compartments by slab partitions. The body was placed in the chamber at one end, along with tools, weapons, food, and other things likely to be useful in the next world, and that compartment of the trench was closed by a cross slab ; the whole was then covered over with earth, forming a long narrow mound or barrow, often called to-day a giant's grave. At the door of this compound tomb a circle of stones was raised, and very often an avenue of standing stones led up to it.

The Alpine Race

At a later date another invasion of Britain took place. These new-comers appear to have started from the great plains in the centre of Asia and worked their way through central Europe. They found themselves at home in the Alps, and so they are now generally known as the Alpine race ; but still pressing westwards they passed to the English Channel and entered England from the east, spreading over the east of Britain generally. They were shorter men than their predecessors, with broad heads and oval faces. In the clash of arms between them and the Long-heads the Broad-heads had the advantage of superior weapons, because in their migration across Europe they had discovered the secret of hardening copper by adding ten per cent. of tin so as to make bronze, thus introducing what is often called the Bronze Age.

They disposed of their dead in a somewhat different

fashion. Instead of a long trench they made a single small chamber, lined and roofed with stone slabs so as to form a stone box or cist—our Scottish word *kist*—and in this the body was placed, sitting or lying on its right side and with the knees bent, so that the burial chamber was only about four feet square. The cist was covered over with earth or stones so as to form a mound or cairn, and round it was raised a circle of tall stones, or sometimes a single stone was set at the door. These standing-stones are found all over the country, and several well-preserved stone circles are still to be seen, the chief Scottish examples being Callernish in Lewis, Stenness and Brogar in Orkney, and Holywood in Dumfriesshire, while a very familiar standing-stone is on the main road opposite the school-house at Brodick. Arran, which yet preserves a great many of its primitive features, has some very fine examples of barrows, cairns, cists, and standing-stones; in the neighbourhood of towns these have nearly all disappeared, having been either buried beneath the rubbish of our civilization or broken up for building purposes.

A beaker.

At a later date still, cremation took the place of earth burial; the ashes were placed in an earthenware pot, and the cist, of course, was made very much smaller. Burnt bones, however, last for centuries, and so to-day we are recovering from these ancient burial-chambers much of the unwritten history of Scotland. These Broad-heads are also known as the Beaker-men, because in their tombs they introduced the beaker form of cup, at first to hold food for the spirit of the departed, and later to contain the ashes themselves. The fashion of cremation which they set seems to have spread rapidly all through Britain, for even the long barrows of the earlier race sometimes contain human ashes.

A funeral urn.

Although the Broad-heads were superior to the Long-heads in weapons they were inferior in numbers, and so, when conquerors and conquered settled down together, the characteristics of the majority prevailed in their descendants. The resulting type is seen to-day in the west of Scotland, especially in lower Clydesdale, where the people are of average height, with hair inclining to be dark, and long-headed, in contrast with the broader-headed people of the east of Scotland, and also with the tall, fair-haired, and blue-eyed race on the north-east coast up to Shetland, who are descendants of the third great European race, the Nordic, which is still seen to perfection in Scandinavia.

The Brythons

The last stream of immigrants in prehistoric times was that of the Brythons, who have given their name to the whole country. They also were long-headed, but with fair hair, blond complexion, and blue eyes, very tall and warlike. They seem to have been an offshoot of the Gauls mentioned by Latin historians, and very probably of the Belgæ of Cæsar's Wars. Indeed, Cæsar's invasion of Britain in 55 B.C. was undertaken in order to punish the natives for having helped the Belgæ in their wars with Rome. They seem to have come into Britain a few centuries before Christ, and they brought with them a knowledge of iron, introducing the Early Iron Age and the kind of civilization known as Late Celtic. They spoke Cymric, an early form of Welsh, and for centuries after the Roman invasion a Welsh kingdom and the Welsh language persisted in Strathclyde.

Chapter IV

THE ROMAN EAGLES

Julius Cæsar: Conquest of England

THE written history of Britain begins with Julius Cæsar, the great statesman and soldier who laid the foundation of the Roman Empire. In the year 55 B.C., and again in the following year, Cæsar crossed the Channel to punish the inhabitants of South Britain for helping his enemies in Gaul, and he has left us, in the fourth and fifth books of his *Gallic War*, a graphic account of his campaigns, as well as of the manners and customs of the people. For nearly a century after Cæsar's expeditions the Romans left Britain alone; but in A.D. 43 the emperor Claudius made up his mind to add Britain to the Roman Empire. He sent over a general with four legions, or from 22,000 to 23,000 infantry, with auxiliary troops, chiefly cavalry, slingers, and bowmen, and he followed up this expedition by arriving in person in the year 44. Of his legions the 2nd and the 20th remained in Britain during all the time of the Roman occupation, and we find many relics of their work in the Scottish Roman Wall. As the conquest of Britain proceeded, these legions were stationed near the frontier lines. The 2nd had its headquarters at Caerleon on Usk (the City of the Legion) till Wales was conquered; the 20th was stationed at Chester, the name of which means "camp," and the 9th at York, which became the military capital of Britain. In the year 61 a great rising against the Romans in the south-east of England was headed by Queen Boudicca (commonly misspelt Boadicea). No fewer than 70,000 Romans were massacred, and Suetonius, the Roman commander-in-chief, abandoned his conquests in the north and

west and hastened to the relief of London. This rebellion cost the Britons 80,000 men, but for ten years there was no more trouble.

Under the emperor Vespasian the conquest of northern England was begun, and in 77 or 78 the legate or commander-in-chief of the Roman armies in Britain was Julius Agricola, with whom the written history of Scotland begins. This we owe to the fortunate circumstance that his son-in-law was Tacitus, the great Roman historian, and in the *Agricola* of that author we have a very full account of all the Scottish campaigns for a period of eight years. Under Agricola the Welsh fortresses were abandoned, the conquest of that region being completed, and in 79 the legate moved his troops from Chester to Carlisle, then east by the Tyne valley to Corbridge, and thence south to York and Lincoln. He strengthened his hold on the district by building a chain of forts, and by making a road from Chester to York, and possibly another from York to Carlisle.

Agricola : Invasion of Scotland

In the year 80 Agricola advanced from Corbridge, where the two Tynes meet, marched straight north into Scotland, and formed a great camp at Newstead, near Melrose, which became the Roman headquarters in the north. Still pursuing the same policy, in the following year he built a chain of forts between the Forth and Clyde with a station at Glasgow, advanced to Stirling, Perth, and farther north, and defeated the Caledonians in a great battle at Mons Graupius, probably in the south of Perthshire ; the misspelling of this name has led to the form " Grampian," applied to the mountains. Not content with land operations, Agricola sent his fleet round the coast on a voyage of exploration, sighted Shetland without landing, and was the first to show that Britain was an island. Neither he nor his successors seem ever to have landed in Ireland, although that country is plainly visible from Kintyre and Wigtownshire. He was recalled by the

emperor Domitian in 85 or 86, and his successors made no further advance but continued to keep garrisons in his forts.

It is interesting to read what Tacitus has to say about the changes introduced by his father-in-law Agricola. " To introduce a system of new and wise regulations was the business of the following winter (79). A fierce and savage people, running wild in woods, would be ever addicted to a life of warfare. To wean them from these habits, Agricola held forth the baits of pleasure, encouraging the natives, by public assistance as well as by warm exhortations, to build temples, courts of justice, and commodious dwelling-houses. He bestowed encomiums on such as cheerfully obeyed ; the slow and uncomplying were branded with reproach ; and thus a spirit of emulation diffused itself, operating like a sense of duty. To establish a plan of education, and give the sons of the leading chiefs a tincture of letters, was part of his policy. By way of encouragement, he praised their talents, and already saw them, by the force of their natural genius, rising superior to the attainments of the Gauls. The consequence was that they, who had always disdained the Roman language, began to cultivate its beauties. The Roman apparel was seen without prejudice, and the toga became a fashionable part of dress. By degrees the charms of luxury gained admission to their hearts ; baths, and porticoes, and elegant banquets came into vogue ; and the new manners which, in fact, served only to sweeten slavery, were by the unsuspecting Britons called the arts of civilized life." It must be remembered that Tacitus is never tired of denouncing the corruptions of the decaying Empire, and holding up to admiration what he is pleased to call the simple manner of the barbarians ; but the plain fact remains that civilization always implies increase of wants, and the Romans civilized us as far as they were allowed.

Hadrian and Severus : Withdrawal of the Eagles

In Scotland, however, even in southern Scotland, that was not very far, and another Roman historian deplores the waste

of life which was involved in trying to conquer two specially obstinate races, the Jews in the far east of the Empire, and the Caledonians in the west. The former were crushed by Vespasian in the year 70, when Jerusalem was trodden down under the Gentiles; but the Caledonians proved of sterner stuff, and were never conquered at all.

In 115, in the reign of Trajan, rebellion again broke out in Scotland and the north of England, and the 9th Legion, advancing from York, was cut to pieces: it disappears entirely from the army lists, and was replaced by the 6th, which we find later on in the Glasgow district. Scotland was abandoned, and the Roman troops were withdrawn to Agricola's line of forts from the Tyne to the Solway. In 119 the emperor Hadrian arrived, and replaced this line by the continuous wall which is still known by his name, although it was rebuilt and strengthened by Severus nearly a century later. The conquest of southern Scotland was again attempted in 141–142, when the emperor Antonine sent over Lollius Urbicus as commander-in-chief, and by 143 the country was so far settled that the Scottish Roman Wall was built from the Forth to the Clyde, along the line of Agricola's chain of forts. Known now as the Antonine Wall, it was long called by country people "Grime's Dyke," probably after a legendary leader of the native races who was said to have broken through the rampart; it was also called the "Devil's Dyke," for it seemed to the uncivilized natives that only some supernatural power could have reared so vast a structure in so short a time.

Even these double ramparts of Hadrian and Antonine did not manage to hold the country; a general rising in 155 swept over the north of England and destroyed most of the forts, and the same thing was repeated on a larger scale in 181. In 208 a determined effort to conquer Scotland once for all was made by the emperor Severus. He landed at Cramond, on the Firth of Forth, moved north to Aberdeen, supported by his fleet, and carried his conquests to the Moray Firth, losing 50,000 men in the process, and all to no purpose. He rebuilt Hadrian's Wall, and died at York in 211, a disappointed man,

but as a result of his efforts the land enjoyed peace and prosperity for seventy years.

From 275 till the end of their rule in Britain, however, the troubles of the Romans increased. New enemies appeared on the scene. Saxons began to raid the south-east coasts of England in 287, and in the west the Scots from Ireland appear as helping the Picts about 300 ; even under the great general Theodosius in 368 the Saxon invaders had penetrated into Kent and up to the very walls of London. Finally, in 410, in reply to urgent requests for help by the Romanized Britons, the emperor Honorius told them that no more help was available : the Empire itself was falling to pieces, and its armies were needed at home. In 418 the Roman treasures were collected, and some of them removed, and by 446 the last of the Roman forces had left Britain.

Roman Roads, Bridges, and Towns

From the foregoing summary of the Roman conquest of Britain it will appear that southern Scotland, the district between the walls, was generally in a disturbed condition, and it is useless to look there for such elaborate remains as those of the Roman baths, temples, and villas which are found in the more settled districts of England, as at Bath, Silchester, and York. Our relics of the Roman occupation are chiefly military—roads and bridges, camps and forts, and the Antonine Wall.

In Roman times the levels of land and sea were practically what they are to-day, but the aspect of the country was wholly different. The land was covered with dense forests in which the oak flourished to an extent not now possible, and where rivers and valleys afforded a clearing these level tracts were mostly swamp and marsh. The historian Dio Cassius, writing of the expedition of Severus in the years 208-211, describes the country as full of rugged and waterless mountains and of barren and marshy plains, destitute of cities, and inhabited by peoples that had barely reached the pastoral

stage of civilization. This desolation continued down to comparatively modern times, for in the reign of James IV. (1500) and his successor most of the Southern Uplands formed a great hunting-ground, and proper drainage of the land did not begin till the year 1800. Even yet the land north of Hadrian's Wall consists mainly of moors and mosses and wastes, untrodden save by the shepherd or the sportsman.

The first duty, therefore, of the Roman invaders was to make roads, an art in which they have led the world. The main road, or line of invasion, was from Corbridge on Tyne north to the headquarters at Newstead, near Melrose; but another and later road ran from Carlisle up Annandale to beyond Moffat, and then branched off to the west, entering Clydesdale at the farm of Little Clyde, where a fine Roman camp still remains. Another road, now called the Well Path, entered from Nithsdale by Durisdeer and the valley of the Powtrail to join the main road at Elvanfoot. From this point it followed the Clyde, practically on the line of the present road, crossed the Mouse by the Roman bridge at Lanark, and the South Calder by another bridge at Bothwellhaugh, then came round behind Uddingston on the line of the present Old Edinburgh Road, and entered Glasgow by the present Drygate to reach the British *cathair*, or fort, called in the old books of Wales Caer Clut, the fort of Clyde. This was afterwards a Roman station, and later the site of the Castle of Glasgow, and on this site the Royal Infirmary now stands. From this point, commanding the fords on the Clyde, the road ran along the Rottenrow, the oldest of Glasgow streets, westward by Dobbie's Loan to Partick and Duntocher, touched the Wall at Old Kilpatrick, and finished at Dumbarton, or Alcluyd —the Rock of Clyde, the fortified hill or Dun of the Britons. It is a testimony to the excellence of Roman engineering that when Telford constructed the present splendid highway from Glasgow to Carlisle he not only followed the line of the Romans but closely imitated their methods of road-making.

From this main road through Clydesdale a branch went off about Carluke to the great fortress at Castlecary on the

Wall, and this was prolonged to Stirling and the great camp at Ardoch. Another branch ran from Carstairs west by Strathaven to the camp at Loudon Hill, and a third came west from Dalmarnock ford at Glasgow by Langside, probably annexing the British camp at Camphill, and on to Causeyside at Paisley, culminating in the fort at Oakshawhead, now the centre of that town, and terminating at Inverkip. Paisley is said to have been the Vanduara of Ptolemy, one of the six towns of Roman Clydesdale, and in fact the prætorium or headquarters of the garrison stood on the site of the Neilson Institution.

Whenever a Roman army halted for the night the soldiers formed a camp protected by earthworks, and on their regular lines of communication permanent camps were established. In contrast to the British camps, which are round or oval, these Roman camps are all square or oblong, having the corners rounded and defended by towers. Two main avenues ran through the camp, one from east to west and the other from north to south, and the prætorium, or headquarters, was placed near the centre where these roads crossed. Some of the great permanent camps, such as Ardoch, could accommodate 30,000 to 50,000 troops, and although none of those in the Glasgow district is so large, the forts at Rough Castle, Castlecary, and Bar Hill were planned for at least 2,000 men. Besides houses or barracks, they contained baths, store-houses, granaries, stables, etc., and it is from examining the ruins of these that most of our knowledge of Roman life in Scotland has been drawn.

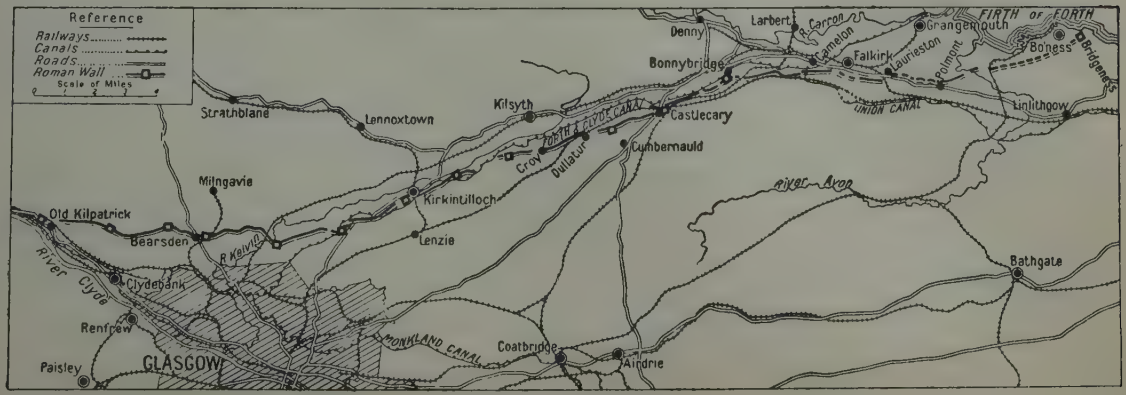
Not only were the Romans our first road-makers, but they were also our first bridge-builders, introducing the principle of the stone arch. Some of the Roman bridges in Clydesdale have been mentioned, but it is not to be supposed that all these are the actual structures built by the Romans. They may be so, but more probably they are of later construction, built on the same site and on the same model.

The Antonine Wall

The chief monument of Roman rule in Scotland is, of course, the Antonine Wall. This is 36 miles long, and runs from Carriden, near Bo'ness, on the Firth of Forth, to Old Kilpatrick on the Clyde. This great barrier consisted of a ditch, the rampart itself, and the military way behind it. Approaching from the north, an enemy would first of all encounter the ditch, 40 feet broad, and sloping gently to a depth of 12 feet, having on its northern side a ridge formed of the rubbish dug out of the ditch. Then came the wall itself, with a stone base and culverts for drainage, but built of turf, the layers being placed grass to grass, as may still be seen where the wall has been cut through. It was 14 feet broad at the base and 10 feet high, tapering to a breadth of 6 feet at the top, which was probably strengthened by a battlement or wooden palisade. At every two miles on an average there was a *castellum* or fort. To the south of the wall, and generally from 40 to 50 yards from it, ran the military way, 16 to 18 feet wide.

The wall seems to have been built from west to east, and its nineteen forts have all been successfully located. These were, in order: (1) Chapelhill, Old Kilpatrick; (2) Golden Hill, Duntocher; (3) Castlehill, Bearsden; (4) New Kilpatrick; (5) Balmuildy, half a mile west of Cadder Wilderness (it was here that a tablet was found with the name of Lollius Urbicus, Antonine's legate in A.D. 142); (6) Kirktown of Cadder; (7) Kirkintilloch; (8) Auchendary; (9) *Bar Hill;* (10) Croy Hill; (11) Westwood; (12) *Castlecary;* (13) Seabegs; (14) *Rough Castle;* (15) Falkirk; (16) Mumrills; (17) Inveravon; (18) Kinneil; and (19) Carriden. Those named in italics were large fortresses, with 1,000 men or more, and the total garrison seems to have been from 10,000 to 12,000. Each fort had two platforms for beacon fires, and the line of forts was placed so as to command the approaches from the north, while the military way behind allowed rapid relief to be sent to any point attacked. There seems to have been an extra fort at

ROMAN DISTANCE STONE. (*By courtesy of the Society of Antiquaries of Scotland.*)



Camelon, an outpost to the north of the wall and an important centre, commanding the gate of the Highlands at Stirling. As the rampart was made of turf it has not been preserved nearly so well as the stone wall from the Tyne to the Solway ; but parts of it may still be seen in good order at Hillfoot, beside Bearsden, at Bar Hill, Castlecary, and Rough Castle, while for a considerable distance the London and North Eastern Railway from Glasgow to Edinburgh runs along its line, and in many places the military way is still a common road.

The wall itself was made in sections by the Roman legions, or regular troops, and they placed their distance-slabs, or milestones, at the end of each section all along the line. Out of the seventeen distance-slabs, fifteen are in the Hunterian Museum of Glasgow University, one is at Levenside, Dumbarton, and the seventeenth, in many respects the most elaborate, is in the Scottish National Museum of Antiquities, Edinburgh. The inscriptions on these show the legions which were engaged, with their regimental titles and crests. Thus the 2nd Legion, the *Augustan* or " Emperor's Own," had for badges the capricorn and pegasus or the winged horse ; the 6th, distinguished as *Victrix, Pia, Fidelis* (Victorious, Loyal, Faithful), was the legion which replaced the unfortunate 9th ; and the 20th or *Valerian* Legion, which had the boar for crest, was also entitled to the honourable title of *Victrix*. The 6th and the 20th Legions were in Britain for three hundred years in all.

A Roman Legion consisted of about 10,000 men, under 60 centurions, and formed a small brigade, comprising infantry, cavalry, engineers, and the artillery of that day, namely bowmen, slingers, battering-rams, and catapults for throwing heavy stones. Besides the 6,000 infantry, mainly seasoned troops of long-service men, there were generally 300 to 400 cavalry in ten troops, and a variable number of auxiliaries or special service men, from 1,000 to 3,000 in number. While the legionaries built the wall, it was the auxiliaries who seem to have formed the garrisons, and in accordance with the

general policy of Rome these auxiliaries were drawn from distant lands, while the Britons who were enrolled in the army were sent away from home to serve in central Europe. Thus from the tablets at Mumrills, between Falkirk and Polmont, we find cavalry of the Tungri from the lower Rhine, and a squadron of Thracians from the Danube ; Rough Castle Fort, near Bonnybridge, was held by the Nervii from the lower Rhine ; Castlecary by the Tungri, and a squadron from Spain ; the great fort at Bar Hill, near Twechar, had another tribe from the Rhine, and a company of archers from far-away Syria ; and lastly, the Castlehill Fort, near Bearsden, was held by cavalry from Gaul.

This mixture of races naturally left behind them a very miscellaneous collection of relics, and in addition to the ordinary rubbish and leavings of a camp we have altars and tombstones representing several religions, from what may be called the state religion of Rome to some of the Eastern faiths, notably the worship of Mithras, and the Christian religion itself. It is beyond doubt that Christianity, of an eastern rather than a western type, was introduced into Britain by the Roman soldiers, some of whom may have received it from the Apostles themselves or their immediate successors.

Chapter V

SOME SCOTTISH SAINTS

Scotland after the Romans

THE Romans were in England for four hundred years, and in Scotland for over three hundred, and from the break-up of their civilization about the year 400 A.D. we may date the beginning of the Dark Ages, a period lasting for nearly seven hundred years. In some respects, indeed, we have even now barely recovered all that was then lost. Our modern roads, modelled on those of Rome, are quite up to the old standard; but in domestic and public architecture, notably in sanitation and heating, we have still much to learn from ancient Rome. Even Glasgow, with its seventy gallons of water per head per day, is incredibly filthy if judged by Roman standards, and in the matter of pure air we have actually been going backwards since the middle of the eighteenth century.

On the departure of the Romans, southern Scotland, never in a very settled state, lapsed into anarchy. Raiding bands of heathen Angles attacked the east coast, though it was nearly a hundred years later that they settled there. Heathen Scots from Ireland were in like fashion raiding the west coast. To the north of the Wall were the unconquered Caledonians or Picts, while between the walls, and extending south to Westmorland, was a race of Britons—Cymri, as they called themselves—speaking Welsh, who afterwards formed the British kingdom of Strathclyde. Galloway was occupied by a detached section of Picts, and it is here that the first evidences of Christianity in Scotland have been recorded.

ST. NINIAN'S CHAPEL, WHITHORN.

(Photo: Valentine and Sons. Ltd.)

St. Ninian

Christianity, probably introduced by Roman soldiers from central and eastern Europe, had made some headway among the people during the last century of the Roman occupation, and the earliest Christian monument in Britain is a cross at the Priory of Whithorn in Wigtownshire. In this neighbourhood, somewhere about the year 360, there was born Scotland's first missionary, St. Ninian, the apostle of the Britons and eastern Picts. His father was a " king," that is to say, a petty chief, and a nominal Christian ; his mother was a devout believer, and Ninian himself was baptized in infancy.

About A.D. 370 he was sent to Rome, probably as a hostage, when Theodosius had just vanquished the Picts and formed the district between the walls into the province of Valentia. St. Ninian's spiritual fatherland, however, was not Rome but Gaul, and he was greatly influenced by St. Martin of Tours, the soldier-saint whose name appears in Martinmas. Consecrated Bishop by Pope Damasus, Ninian returned to Scotland, taking with him some monk-masons lent by St. Martin, and in 397 at Whithorn he built the first stone church in Britain, the famous Candida Casa, the white hut, called afterwards in English, Whit-erne, the modern Whithorn. Here he founded a monastic settlement, combining evangelistic work with study and the arts and crafts of a self-supporting community, somewhat like our industrial missions in Africa at Lovedale and Livingstonia ; and from this as a centre he and his men evangelized all the south and east of Scotland and as far north as Shetland. Not even Columba has left so many traces on the map of Scotland, and the apostle's name occurs in many well-known forms, as Ninian, Ringan, and Monan, and very often in connection with wells, as he seems to have been a Scottish John the Baptist. For eleven hundred years Candida Casa was the most famous place of pilgrimage in Scotland, or indeed in Britain.

In the course of his missionary journeys St. Ninian paid a visit to Caer-Clut, the early name of Glasgow, and there he

secured and consecrated for Christian burial a patch of ground which is now the graveyard of the Cathedral, although we are told that the first burial in it was a hundred years later, in the time of St. Kentigern or Mungo. Ninian died in 432, and a heathen reaction seems to have set in, but his indirect influence on Scotland was more lasting. One of the pupils of Candida Casa was Finian or Finbar, who founded Dornoch church, and finally settled in Moville, Ulster, where he died in 579. Another pupil, Carnoc or Carnech, was the first apostle to Ireland, and baptized St. Patrick, a slave who had been born at Old Kilpatrick, on the Clyde, and captured in early youth by Irish raiders. Finian had brought to Ireland the first copy of the Gospel, and it was the copying of this by Columba that led to the exile of that great missionary, and the foundation of his settlement in Iona. "No one," says Forbes, "can stand within the precincts of the ruined priory of Whithorn, or look out to sea from the roofless chapel at the Isle, without emotions which are difficult to describe . . . and all this historic interest centres round one single figure, sketched in faint outline by the Venerable Bede, filled in by the graceful hand of the amiable Ailred, commemorated in the dedications of many churches throughout the length and breadth of Scotland—Ninian, the apostle of the Britons and the Picts."

Candida Casa was built in 397, St. Columba died in 597, and Glasgow Cathedral was founded in 1197, three links in the chain which found expression in St. Mungo's prayer: "Lord, let Glasgow flourish through the preaching of the Word and the praising of Thy name."

King Arthur and his Times

To the time of pagan reaction which followed the death of Ninian belongs the stirring story of King Arthur. Everybody has heard of Arthur and his Knights of the Round Table, of Lancelot and Guinevere, of Elaine the lily maid of Astolat, of Galahad and the Grail. In Malory's *Morte*

D'Arthur and Tennyson's *Idylls of the King* we have the picture of a Christian champion, the flower of chivalry and the fountain of honour, the spotless hero of marvellous deeds not only in Britain but all over Europe. Stories, however, are like snowballs ; they grow as they go ; and many localities claim to be the scene of King Arthur's exploits. Careful research seems to show, however, that when we trace the Arthurian legends back to their origins we arrive at a real historical person, not a king, but the head of a British federation in Strathclyde, in the century after Ninian. His enemies were the heathen Scots on the west, the Picts on the north, and the Angles on the east, and against these he fought and won twelve battles, the sites of which have all been identified in lowland Scotland. As the result of a victory at Bowden Hill, West Lothian, in 516, he divided the conquered territory among three brothers. To Urien was assigned Reged or northern Strathclyde, Arawn held Yscotland beyond the Wall as far as Stirling, and Llew or Loth, King of the Picts, Arthur's brother-in-law and ally, ruled over the eastern territory on the Firth of Forth, now called Lothian. Loth was the father of Thenaw, whose name survives in Tannochside and St. Enoch's, Glasgow, and she was the mother of Kentigern or Mungo, the real founder of Glasgow and its patron saint, of whom more will be said by-and-by.

For twenty years after this victory the land had rest, but in 537 a fresh pagan combination was formed under Mordred, Arthur's nephew, and at Camelon, near Falkirk, a great battle was fought in which both leaders fell, and which overwhelmed Christianity in Scotland for a whole generation.

Finally in 573 Rydderch Hael, Roderick the Generous, assisted by Aidan king of the Scots in Argyll, and Maelgwen Gwynedd of Strathclyde, defeated the pagan hosts at Ardderyd (Arthuret) near Carlisle, and re-established Strathclyde as a Christian kingdom with St. Kentigern as its bishop at Glasgow. Merlin, who figures as an enchanter in the Arthurian stories, was one of the supporters of the pagans ; he fled from the battle and for many years led a half-crazy life in upper

Tweeddale. He was clubbed to death by some shepherds and buried at Drummelzier, and an old rhyme ran :

> " When Tweed and Powsail meet at Merlin's grave,
> Scotland and England shall one monarch have."

This unlikely event actually occurred during an extraordinary flood in 1603, when the waters of the river and the Powsail Burn joined at this spot, and the curious may speculate on the value of the old prophecy.

St. Kentigern, the Founder of Glasgow

The outstanding figures of the sixth century in Scotland are Kentigern and Columba. St. Kentigern, better known by his pet name of Mungo, " my dear one," was the son of Thenaw or Teneu, daughter of Loth. Cast adrift by her father, her coracle stranded at Culross on the Fifeshire coast, and there in 518 she gave birth to Kentigern. The boy was tended by St. Serf at Culross, and the bird and the tree on the arms of Glasgow commemorate stories of his childhood there. Leaving Culross, his mother and he crossed the Forth into Stirlingshire, where he found an aged saint called Fergus, who like Simeon of old had prayed that he might not see death until his eyes had seen the coming apostle. Fergus died, and Kentigern, yoking two oxen, put the body on a rude cart and continued his journey westwards. Here the old chronicler may tell the story in his own words: " In truth, the oxen, in no wise restive or disobeying the voice of Kentigern, came by a straight road as far as Cathures, which is now called Cleschu," and halted at the ancient cemetery consecrated by Ninian a hundred years before. Here Fergus was buried, and in the Fergus Aisle of Glasgow Cathedral may still be seen a rude drawing of a man and a woman, with a bullock-cart conveying a dead body, and the inscription, " This is the ile of Car Fergus." Kentigern's mother Thenaw lies somewhere in the square the name of which has been corrupted into St. Enoch ; the present Argyle Street was for

centuries known as St. Thenaw's Gait (road); the stream which now flows underground was called St. Thenaw's Burn; and her chapel was still standing about the beginning of the eighteenth century.

On the banks of the Molendinar Burn Kentigern set up his first church, and round it soon gathered an industrial mission, a community formed on the lines laid down by Ninian. In the pagan reaction which followed the battle of Camelon, he and his monks had to take refuge in Wales, the other Cymric and Welsh-speaking kingdom. There he was welcomed by Dewi or David, the patron saint of Wales, and settled in the valley of a river which so strongly resembled his Clyde at home that he gave it the name Clwyd (Clooïd), which it bears to this day. The victory of Roderick at Ardderyd in 573 recalled Kentigern to Glasgow at the age of fifty-five. More than six hundred of his brethren accompanied him, and King Rydderch and his men met him at Hoddam in Dumfriesshire, where he fixed his see for some time before returning to Glasgow. The well-known story of the Queen of Cadzow and her ring belongs to this period, and both salmon and ring figure in the city arms along with St. Serf's robin and the hazel branch, though this has now become an oak tree. The mound on which the tree stands represents the Dovehill, from which Kentigern addressed the people on his return, and the bell is his own hand-bell which was used in the church services.

Arms of Glasgow.

St. Columba and the Irish Missionaries

It was about this time that the memorable meeting of Kentigern and Columba took place. Columba, a Gaelic-speaking Scot from Ireland, had landed in Iona and formed there a monastic community, which speedily became the centre of a great missionary movement among the Gaels and Picts in the west and centre of Scotland. In 584 Columba was in Strathtay, and probably this was also the date of his visit to Glasgow. Jocelyn, the monk of Furness who wrote the life of Kentigern, gives a graphic description of the meeting of the saints, with their companies of monks singing and answering in chorus; and a modern writer asks, "Is there any more memorable incident in the history of the Scottish Church than that meeting of its two founders beside the cemetery consecrated by Ninian, their distinguished predecessor?" Kentigern died in 603, having outlived Columba by three years.

During the same century a steady stream of Christian workers went forth from Whithorn, from Glasgow, from Iona, and from Ireland, and the names of many of these early missionaries are still preserved in the place-names of the west of Scotland. For example, in the Firth of Lorne there lies a chain of islets called Garvelloch, "the rough cells" (from *aileach*, a stone beehive cell), or the Isles of the Sea, and on the most western of these, Eilean n'an Naoimh, the Island of the Saints (originally, the sacred *aileachs*), there are still to be seen the ruins of an ancient church and the beehive dwellings erected by St. Brendan in 542, at least twenty years before Columba landed in Iona. This islet is called Hinba by Adamnan, who wrote the life of Columba; Columba often worshipped there, and the gravestone of his mother, Ethne, still stands, a simple headstone of slate marked with a cross. St. Brendan has given his name to Kilbrannan Sound, and to the people of Bute, who are called Brandanes to this day.

In the south end of Bute is the ruined chapel of St. Blane,

another contemporary of Columba, whose sphere of influence as bishop extended from Dunblane, his chief town, to Kingarth in Bute and Southend in Kintyre, where the ruins of his church are still found near Kilblaan. The prefix *kil-*, so common in the West, was originally the Latin *cella* (kella), the monk's cell; then it came to mean the church, and lastly the enclosure, especially the burying-ground, round the church. Numerous examples are such well-known places as Kilmarnock, Kilwinning, Kilbride, Kilmay, etc., nearly all of them dating back to the sixth century.

The patron saint of Paisley is St. Mirin, who along with St. Regulus or St. Rule is reported to have brought to Scotland the relics of St. Andrew the apostle. St. Rule settled in St. Andrews, but St. Mirin came west to Paisley, and with him came four companions, Barchan, Fillan, Malcolm, and Peter, whose names all occur in the district. Kilpeter is now known as Houston, Hugh's town, but the old name has been retained in St. Peter's Burn and St. Peter's Well, and Houston fair day in July is still called Peter's Day. Near Houston are two mounds, the North Mound and the South Mound, supposed to mark the camps or more probably the burial-places of two armies in prehistoric times, and about two miles off is Barochan Cross, the most interesting Christian monument in Renfrewshire, although of tenth-century date. Lamlash preserves in disguise the name of St. Molaise, whose church was on Holy Isle. Inchinnan has two curious stones, one the so-called chariot of St. Conval, a sixth-century Irish saint; the other, the base of an old Celtic cross, is now known as the Argyll Stone, from the fact that in 1685 the Earl of Argyll was captured here while resting after his disastrous expedition. Govan church is officially the church of St. Constantine, who founded a monastery here in 565, and was martyred in Kintyre, where his name remains in various forms. He was buried at Govan; his stone coffin is still preserved within the parish church, and the churchyard contains a very fine collection of Celtic monumental stones dating from the sixth to the tenth century. The finest early Christian

monument in Scotland is at Ruthwell, Dumfriesshire, the famous Ruthwell Cross, highly ornamented with religious emblems, and bearing lines from an early English poem, *The Dream of the Holy Rood*. This was written by Caedmon, the Anglo-Saxon Milton, who died in 680, and the cross must therefore date from about 665.

The Celtic Monasteries

That Christianity was firmly established in Britain from the year 300 is well-known from the testimony of writers like Tertullian (160–230), Chrysostom (347–407), and Augustine (354–430), and also from the presence of British bishops at the Council of Arles in 314. The missionary settlements associated with the names of Ninian, Kentigern, Columba, and others of that time, were, however, of the monastic type common in the East and introduced into Gaul by St. Martin. As already said, they resembled our modern industrial missions; the preachers had first of all to build their church, usually oblong, and their own beehive huts, surrounding the whole with a cashel or stone wall. Then they had to provide for their living, for idleness and begging formed no part of their creed, and so we find them busy at field-work, farming and fishing, and developing centres of industry and even of trade. These varied occupations appear in the Song of St. Columba:

> "At times kneeling to beloved heaven,
> At times at psalm-singing,
> At times contemplating the King of Heaven,
> Holy, the Chief.
> At times at work without compulsion,
> This would be delightful,
> At times plucking dulse from the rocks,
> At times fishing,
> At times giving food to the poor."

They set up training-schools or colleges, and the place-name Bangor is still attached to two famous offshoots from

Candida Casa, the one in North Wales, and the other near Belfast. Not content with evangelizing Britain, many of these Culdees, as they were called, passed over to the Continent, and one of them, St. Columban, founded several monasteries in France, visited Switzerland and Italy, where the town of San Columbano still bears his name, and founded in the Apennines the famous monastery of Bobbio, where he died in 615. A pupil of his, St. Gall, founded the still more famous abbey of St. Gall, and the town and canton of that name in eastern Switzerland remain as his monument.

The evangelical zeal of these Celtic missionaries was coupled with a love of learning. They were students as well as preachers, book-makers and book-lovers, and have left their handiwork in the form of beautiful manuscripts, ornamented with the peculiar interlacing tracery which marks the Celtic style. Among these are the *Book of Deer*, Adamnan's *Life of Columba*, and most splendid of all, the *Book of Kells;* and the library of St. Gall alone contains among the Scottish manuscripts not merely Biblical works but copies of the Latin classical authors from Virgil down to Augustine. Never at any other period, says Dr. Mackinnon, have Scotland and Ireland possessed such a European reputation, such a far-reaching importance.

Chapter VI

SCOTLAND IN THE MELTING-POT

Britons, Picts, Scots, and Angles

For five hundred years after the time of Kentigern and Columba, Scotland, and England also for that matter, were in the melting-pot. It was a period of almost constant war, generally internal war, and in the dust and smoke of conflict civilization seems to have wellnigh disappeared. In Europe, which was passing through similar disorders, these centuries are known as the Dark Ages, and it is only when we come down to about A.D. 1000 that we find solid forms emerging from the mists.

At the beginning of this period Scotland was divided into four nations. To the north of the Forth and Clyde lived the Picts, the Caledonians of the Romans, a Celtic people, speaking a language like Gaelic or Welsh. Along the east coast they had been evangelized by Ninian and his successors, and were thus nominally Christian. A detached community of Picts was also found in Galloway, where the racial type persists to this day.

To the south of the Forth and Clyde valley most of the south of Scotland as well as part of England was occupied by the Britons or Cymri, a Welsh-speaking Celtic race. They constituted the kingdom of Strathclyde, which extended from Cumbernauld on the north to Cumberland on the south, a kingdom which persisted till 1018. Their military capital was Alcluyd, the rock of Clyde, called by the Angles Dun-Briton (Dumbarton), the rock fortress of the Britons, and they possessed several towns which still bear their Welsh names, such as Glasgow, Peebles, Lanark, and Kelso. These

Britons had been included in the Roman province of Valentia and had absorbed a fair degree of Roman civilization, and they were the earliest inhabitants of Scotland to receive the Gospel. All through the sixth century, in the wars of Arthur and his successors, they appear as defenders of the faith against the heathen Angles.

In the west were the Scots, a Gaelic-speaking people from Ulster, coming first to Kintyre, then establishing a kingdom called Dalriada in what is now Argyll, with its capital at Dunadd on Loch Crinan, and finally extending their sway at the expense of the Picts over all the west of the country and a large portion of the centre. They were heathen in King Arthur's time, but were christianized by St. Carnech and St. Patrick in Ireland and by St. Columba and the Culdees in Scotland, and later their power became so great that in 844 Kenneth MacAlpin, King of the Scots, was master of all the country north of the Forth and Clyde, and the whole land received its present name of Scotland.

Last of all in time, but foremost in energy, came the Angles, English-speaking heathens from across the North Sea. They settled on the east coast of England and gradually crept into Scotland from Tweedmouth, swarming up the valley of the Tweed and extending along the south shore of the Firth of Forth, overrunning Fife and penetrating as far as Angus. It was against those Angles that Arthur fought his most stubborn battles in the sixth century, but their progress was not finally arrested till the year 685, when Brude, King of the Picts, inflicted a crushing defeat on them at Nectansmere, now called Dunnichen, near the town of Forfar.

The Norsemen

By the year 800, however, a new force had appeared on the scene, of special concern to the south-west of Scotland. These were the Norsemen or Vikings, the sons of the vik or bay, the hardiest and most daring seamen the world had ever known since the days of ancient Tyre, famous for their

skill as navigators and dreaded for their pitiless ferocity. They colonized Iceland and Greenland, were the real discoverers of America five centuries before Columbus, and had sailed round the North Cape and seen the midnight sun. Two hundred years after this we find them settled in France and all along the Mediterranean ; having dropped both their heathen religion and their Norse speech, they had become known as Normans, the greatest conquering race that Europe has seen since the Romans.

Starting from Norway these Norsemen overran Orkney and Shetland, seized Caithness and Sutherland ("southern land," they called it, in contrast to Norway and the northern islands), and swept round Cape Wrath, conquering all the Western Isles as far south as the Isle of Man and even Anglesea. It was in this connection that part of their fleet came up the Firth of Clyde and fought their first battle with the Scottish Gaels in Arran. This raid, however, was merely the introduction to a systematic conquest, and in 867 a great Norse fleet under Olaf the White, the Norse King of Dublin, entered the Firth of Clyde, conquered Arran, and attacked Alcluyd itself, which they captured after four months' fighting by land and sea. Arran became a Norse possession, and to this day it is full of Norse names. Names ending in *-a*, *-ay*, or *-ey*, the Norse for island, are very common : Islay, Jura, Staffa, Sanda, Pladda, and many more ; names ending in *-dale*, a valley, as Ormidale, Glen Chalmadale, or in *-wick*, a bay, as Brodick, the broad bay, or *-gill*, a ravine, as Corriegills ; and names based on money value, as Merkland, Pennyland, Dippen or twopenny land, are all Norse, while the Norse *-ness* (nose) for cape occurs along with the Gaelic *-ard*, meaning the same thing. Names such as these occur all round the British coasts, and they serve to mark the track of the Vikings.

Strathclyde merged in Scotland

In the year 1005 Malcolm II. became King of Scotland, and three notable events happened in his reign. First, his

daughter was married to Sigurd, the Norse Earl of Caithness and Sutherland, and on his death those territories came under Scottish rule. Second and most important, at the great battle of Carham on the Tweed in 1018, Malcolm, aided by Owen of Strathclyde, inflicted a lasting defeat on the Angles, and practically settled the boundary in the east between Scotland and England where it is to-day, instead of having an Anglian kingdom stretching over the Lothians up to the Firth of Forth. Lastly, a short time after this victory Owen died, the last prince of Strathclyde, and that ancient British kingdom, including Cumberland, was merged in Scotland, leaving Malcolm as sole ruler.

Malcolm was followed by Duncan, Duncan by Macbeth, and Macbeth by Malcolm III. (Canmore), who married Margaret, sister of Edgar the Atheling of England, the St. Margaret of Scottish Church history. In this reign Cumberland was lost to William Rufus. Margaret's three sons Edgar, Alexander, and David succeeded in order, but the south-west of Scotland was not affected till the reign of Edgar the Peaceable (1097–1107). In the year 1100, when Magnus Barefoot was King of Norway, the Western Isles of Scotland rebelled against him, and he fitted out a great fleet for their reconquest. This was accomplished in 1102, and his conquests included the Isle of Man and Anglesea, and also Kintyre, for he claimed as islands all lands he could sail round, and seated in his galley he was dragged over the narrow neck between West and East Loch Tarbert, thus by a stratagem retaining the whole peninsula.

David I.: a New Era

In his will Edgar gave instructions that his brother Alexander was to rule north of the Forth and Clyde, with the title King of Scotland, and that his younger brother David was to rule over the south as Prince of Cumbria, and this arrangement was carried out. It brought important results for Strathclyde, for David was a most progressive and enlightened prince, perhaps the very best ruler that Scotland

ever had, and his subsequent reign over the whole country as David I. (1124–53) marks the beginning of a new order of things in church and state, which continued until the reign of Queen Mary, four centuries later.

David's sister had been married to Henry I. of England, and his own wife Matilda, daughter of the Earl of Northumberland, brought him large estates in England, so that in his younger days he was on intimate terms with the Anglo-Norman court of England, and brought into Scotland not merely Anglo-Norman manners and methods, but also many Norman nobles and Flemish traders. The great officers of state were Normans, the Constable, Chamberlain, Seneschal, Marshal, and Chancellor, and most families of the Scottish nobility took root in this reign. It is rather surprising to learn that most of the great names which figure later on in the Scottish War of Independence are those of Norman families introduced by David. The Bruces came from Yorkshire, the Comyns and the Balliols from France, though the latter owned also the territory of Furness; the Morays were also Norman, and Walter the Steward of Scotland, founder of the Stuart dynasty, was brought from Shropshire and gifted with lands in Renfrewshire. The Clyde valley contains many place-names recalling feudal lords who date from this time—Symington or Simon's town, Thankerton or Tancred's town, Houston or Hugh's town, and many more. Alive to the importance of cultivating native industries, especially weaving, David encouraged weavers to come from Flanders, in this also copying the example of the English kings.

Abbeys; Religious Orders; Burghs

In Church matters he continued and extended the work of his mother, St. Margaret, and in founding monasteries and endowing them at the public expense he was so generous as to draw from James I. the well-known saying that he was "a sore saint for the crown." He founded in this way the abbeys of Kelso, Dryburgh, Melrose, Newbattle, Dundrennan,

Kinloss, Cambuskenneth, Holyrood, and Jedburgh, and to the four bishoprics existing at his accession he added other five. It is to be remembered to his credit that in those disturbed and backward times a monastery really stood for nearly all that we call civilization; its members were not only the spiritual advisers of the people, but their missionaries, teachers, doctors, and almoners, and the lay brethren led the country as farmers, cooks, tailors, builders, gardeners, etc., besides being the sole exponents of literature and the fine arts, and the only hotel-keepers in the country. Yet with the best intentions David sowed the seeds of evil, for a church that is "rich, and increased with goods, and has need of nothing," contains within itself the elements of corruption, like Laodicea of old.

David also introduced into Scotland two great religious and military Orders which were formed during the Crusades, the Knights Templars and the Knights of St. John of Jerusalem, generally known as the Hospitallers. To the latter he gave a house at Torphichen in West Lothian, and the former were settled first at Temple on the Esk in Midlothian, and later at Inchinnan near Renfrew, where they remained for nearly two centuries. When the old church of Inchinnan was pulled down in 1828 the floor was found to be almost solid with the bones of the Templars, those mail-clad monks who cut such a figure in *Ivanhoe*, and grew to so dangerous a height of power in Europe that in 1312 Pope and kings combined to suppress them.

A more permanent monument to David is found in the burghs which he created, the beginnings of local self-government. Of the total number of eighteen Scottish burghs founded before the end of his reign, no fewer than seven arose in his own earldom—Rutherglen, Lanark, Dumfries, Peebles, Selkirk, Jedburgh, and Roxburgh—every one of them on crown lands and near a royal residence, and probably therefore the seat of a royal court of justice.

PAISLEY ABBEY.

(Photo: Valentine and Sons, Ltd.)

Paisley and the Stuarts

David's great friend, Walter, son of Alan, whom he brought from Shropshire, followed his monarch's example. He founded Paisley Abbey about 1163, according to the Clugniac Order, the Order of the Brethren of Wenlock in Shropshire. The charter was signed at Fotheringay, where four hundred years later his most famous descendant was to lay her head upon the block. Walter himself was said to be descended from the Banquo of Shakespeare's *Macbeth*, and the dramatist alludes to this when he makes Macbeth see the long line of Banquo's descendants, some of them carrying twofold balls and treble sceptres. Paisley Abbey was the burial-place of the Stuarts till in the person of Robert II. they became kings; and Marjorie Bruce, daughter of the great Robert and wife of Walter the sixth High Steward, "the lass" who brought them the crown, lies in the Abbey, where her monument, erected by Queen Victoria, is known as "Queen Blearie's tomb." She met her death through an accident, leaving an infant child, the future Robert II., the first of the Stuart kings. One of the infant's eyes had been injured, and he was known as "King Blear-eye" or Blearie, and somehow the royal title and the nickname were conferred on his mother, who had not lived to become a queen.

"The Inquest of David"

Glasgow has a very special interest in David, for one of his first acts as earl was to form a bishopric out of his own principality of Cumbria, practically the old British kingdom of Strathclyde, and as its first bishop he appointed his own tutor, John Achaius. Bishop John entered upon his duties in 1115, and one of the first of these, at the command of his princely master, was to take stock of all the lands and possessions belonging to the Church of Glasgow. This famous document, called "The Inquest of David," really laid the

foundation of modern Glasgow, and its opening words are worth quoting: "David, Prince of Cumbria, chiefly from love to God, but partly also from affection to and by the exhortation of Bishop John, caused inquiry concerning the lands pertaining to the Church of Glasgow in each of the provinces of Cumbria which were under his dominion and rule [for he did not rule over the whole of Cumbria], so that, eager for the restoration of that church, he might leave to the next generation and their successors a certification of those possessions which of old it had held; these, aided by the help and counsel of the old and wise men of all Cumbria, as far as he was able, he has ascertained as they are hereinafter set forth." Then follows a list of the Church lands, a most valuable document of a time regarding which such records are scarce, containing details of Ruglan, Perdeyc (Partick), Guven (Govan), and many other places, the names of which have survived until to-day. Of Kentigern's original church no trace then remained, but Bishop John built the first stone cathedral in honour of God and St. Mary, with its high altar immediately over the tomb of St. Kentigern, and the choir was consecrated in 1136.

As their territories covered nearly the whole of the south of Scotland, the bishops of Glasgow were naturally persons of some consequence in the kingdom, and we are not surprised to find that eight of them filled the office of Chancellor, and one that of secretary to the king. Three deserve special mention in connection with the development of Glasgow and the west of Scotland. In 1174 Jocelyn, Abbot of Melrose, became Bishop of Glasgow, a noteworthy man in many departments. Animated by that historical sense which is at the base of all good citizenship, he commissioned a namesake of his, Jocelyn of Furness, to collect the stories which had gathered round St. Kentigern, and from these to compile the life of that saint which is still in our hands. He enlarged the church begun by Bishop John, and had begun the nave and the two transepts, when an unfortunate fire destroyed the choir, the part of the cathedral already in use. Jocelyn

TOMB OF MARJORIE BRUCE, PAISLEY ABBEY.

(By permission of Messrs. Alexander Gardner, Ltd., Paisley.)

immediately set about rebuilding it, however, a task which was accomplished in 1197.

Glasgow a Burgh: the Fair

But his greatest work for Glasgow was neither in books nor in buildings. He was a friend of William the Lion, and from that monarch he obtained authority, somewhere between 1175 and 1178, to have a burgh at Glasgow with all the rights and privileges of a royal burgh, and a further charter in 1190 empowered him to hold a Fair for eight days—"from the octaves of the apostles Peter and Paul"—commencing on 7th July. This was confirmed by a later charter in 1211, ordering the king's peace to be kept during this time, under a fine of 180 cows for manslaughter. Such was the origin of Glasgow Fair, which has continued down to the present day, and although its original purpose of a general market has been lost, it still marks the chief holiday period not only of Glasgow, but of Clydesdale generally. The Fair was a great event in the countryside. At Glasgow there gathered for business or devotion, says a historian, craftsmen from Selkirk, guild-burghers from Dumbarton, Solway fishers, shepherds from the Forest, Nithsdale yeomen, squires of Carrick, Clydesdale knights, the lordly abbots of Jedburgh and Crossraguel, Highland chiefs from the Lennox, and Border mosstroopers from the Liddell and the Esk. Ordinary trade was suspended and all was centred in the Fair, and in addition to business and devotion—for the Fair commemorated the consecration of the Cathedral on the octave, or eighth day, after the feast of St. Peter and St. Paul—games and sports were held, and all sorts of amusements provided; apart from the holidays, it is these last alone, in a sadly debased form, which now represent Glasgow Fair. It was at first held at the "Wyndheid," where Rotten Row enters the High Street; then at the Water Port at the foot of the Stockwell, and then for many years on Glasgow Green; finally, in 1871, the merry-go-rounds and other "shows" were trans-

ferred to Vinegar Hill, where they still drag out a dead-and-alive existence. The humours of Glasgow Fair have formed the subject of many poems and ballads, chiefly by writers of the eighteenth and early nineteenth centuries.

A second fair, known as St. Mungo's Fair, was held near the Cathedral, and extended over the Christmas and New Year holidays. It was reckoned backwards from St. Mungo's Day, 18th January, and lasted for twenty days—hence its other title, " The Twenty-Day of Yule." A third fair on the day before Good Friday, and a fourth upon Whit Monday, are mentioned along with the older markets in a charter of Charles I. dated 1636. It was in connection with Glasgow Fair that Alexander II., in 1226, forbade the magistrates of Rutherglen to take toll in Glasgow, the boundary line for that purpose being fixed at the cross of Schedingstun, now Shettleston, which shows that Rutherglen then possessed extensive territory on the north of the Clyde. A similar attempt by Dumbarton was checked by Alexander in 1243 in a charter granting full liberty to Glasgow men to buy and sell in Argyll and Lennox, and throughout the whole kingdom, as freely as they did before the burgh of Dumbarton was created in 1221.

Somerled's Rising: Battle of Renfrew

David's grandson, Malcolm the Maiden, continued to favour the see of Glasgow. In his reign Northumberland and Cumberland were lost to Henry II., and in 1164, the year before his death, the Clyde was the scene of a battle which has received too little attention, for it practically settled whether the speech of Lowland Scotland was to be Gaelic or English. There had always been in the north of Scotland powerful nobles who disputed the throne with Duncan I. and his descendants; Macbeth is the best known of these, and the only one who was successful. One of these pretenders, in the reign of Malcolm IV., tried his luck in war, and secured the powerful help of his uncle, Somerled, the " regulus " or

kinglet of Argyll, and the renowned ancestor alike of the Lords of the Isles and the Macdougalls of Lorn, both afterwards mortal foes of Bruce. Somerled gathered a great fleet of 160 ships from all the Western Isles and Ireland, and invaded Clydesdale, sailing up the Firth and landing at Renfrew. The royal troops, much smaller in number, but better armed, better drilled, and certainly much better led, were under the command of Walter the High Steward, whose castle was at Renfrew and whose headquarters were at the Knock, between Renfrew and Paisley. The battle raged from Newshot, the only one now left of Clyde's many islands, up to Inchinnan, where the Cart joins the main river, and the Highland host was broken to pieces. Somerled and his son fell in the fight, and so many hundreds more that the place is still called "The Bloody Mire." So thorough was the defeat by a mere handful of the royal troops that it was ascribed to a miracle, and a curious rhyming Latin poem is still in existence, written by one William, an eye-witness of the fight and probably one of the Cathedral clergy, in which he claims the victory as due to the direct intervention of St. Kentigern in answer to the blaspheming challenge of Somerled. This is the battle of Renfrew, 1164, and it settled the racial and language questions for two centuries and a half. The final settlement came at the "red Harlaw" in 1411, for the Jacobite rebellions of the '15 and the '45 came too late to affect either race, language, religion, or politics.

The Norsemen: Battle of Largs

A hundred years later the West was the scene of a more important battle, again a conflict of races, this time Norse and Scots. Mention has already been made of the Viking invasion of 867, when the Norsemen gained possession of Arran and captured Alcluyd or Dumbarton. By the year 1230, however, under Alexander II., the power of Scotland had increased to such an extent that Hakon, King of Norway, sent Ospak with a great fleet to the Firth of Clyde. Using

Arran as his base, Ospak attacked and captured the royal castle of Rothesay, but he died shortly afterwards and the invasion was arrested. Alexander struck a blow in return, and in 1249 he expelled the Norse from the Clyde islands, led a Scottish fleet round the Mull of Kintyre up to Oban, and there he died in his turn.

Fourteen years later, in 1263, Hakon determined to put the matter to the test once for all, and raised a powerful fleet, the greatest that ever left the shores of Norway, being supported on this occasion by the Lord of the Isles, Magnus of Man, and all the western chiefs except Ewen of Argyll. The Norse fleet assembled at Bergen in Norway and crossed to Orkney, and while lying there at Ronaldsvoe, the Norse chronicler tells of a strange sight—a great darkness covering the sun, so that only a little ring of light was seen. This, in modern language, was an annular eclipse of the sun, and astronomers tell us that such an eclipse happened on August 5, 1263. From Orkney King Hakon passed down the west coast by Skye, where Kyleakin still bears his name, and rounded the Mull as before, and the watchers on the hills above Largs saw the great fleet of 160 ships anchoring off Lamlash. Sixty of these crept up Loch Long, and at Arrochar they were dragged across the narrow neck to Tarbet on Loch Lomond, whence they struck terror into the defenceless Lennox.

The Scottish host under Alexander III. was posted on the hills above Kilbirnie, playing a waiting game and attempting a settlement by negotiation; but Hakon was out for nothing less than the unconditional surrender of all the Western Isles, including those in the Firth of Clyde, and the peninsula of Kintyre. To enforce his demands his fleet moved up to the Cumbraes, but Alexander still kept talking, waiting till the weather should break; and at length on Wednesday, October 3, 1263, a terrible storm of wind and hail broke over the hostile fleet. Five great warships were driven ashore, and many others in Largs Bay were more or less disabled. Some thousands of the Vikings had landed to safeguard their stranded ships, but the Scottish army seized the opportunity

of a piecemeal victory, and, charging down the hill, swept their enemies into the sea. Hakon was utterly routed; he begged a truce to bury his dead, and retired to Lamlash. He wished to winter in Ireland and renew the attack next spring, but his men were thoroughly cowed, and the stern old warrior, broken in health, withdrew to die at Kirkwall. That was the end of a three-century tale; the Norse invasions were never repeated, and the whole of the Western Isles passed under the dominion of Scotland, leaving only Orkney and Shetland under Norse rule.

THE "AULD PLACE," KILBIRNIE,
where the Scots mustered for Largs.

Chapter VII

A SCOTTISH BURGH

"Town" and "Burgh"

THE word "town" is an old English term, *tun* (toon) meaning a fence round a farmhouse, a homestead (the "ferm toun" of Lowland Scots), or even round a whole village. The clachans in Arran, especially on the west and south coasts, are examples of little communities that developed out of the original farm-steading and its outhouses. The dwellers in the "town" were thus mostly farm servants or dependents of some sort, and this is the essential difference between them and "burghers." The "burgh" (*borough* in England, *burg* in Germany) is primarily a stronghold, a place of defence and shelter, the fortified house and courtyard of some strong man—king or noble or prince of the Church. When not surrounded by walls it had at least a mound and ditch, and the dwellers within, though vassals of their lord, were freemen. We hear of "royal burghs," whose freemen were the direct servants of the king, and of "burghs of barony," in which the overlord was a noble or a prelate; but their constitutions were similar, and when David I. gave the burgh of Renfrew to Walter the Steward, and William the Lion gave Glasgow to Bishop Jocelyn, the charters expressly said that their privileges were to be equal to those of the king's own burghs.

From early times four burghs in Scotland had a system of government, the "Leges Burgorum," which became the model for all others. These four burghs were Edinburgh, Roxburgh, Berwick, and Stirling, three of them in the district of Lothian; indeed, it is interesting to note that all the old

place-names ending in *-burgh* occur in that district—Edinburgh, Musselburgh, Roxburgh, Dryburgh, and Jedburgh. As a matter of actual history, however, Dumbarton and Glasgow are much older; the latter, as we have seen, goes back to prehistoric times, and Dumbarton was not only the chief fortress of the early Britons, but under the Romans was also the chief naval station of the west, and a "municipium" or self-governing community modelled on Rome itself.

Freemen of the Burgh

A mediæval burgh thus denoted a community of freemen, self-governing, and having certain property in common which was later known as the common lands or the "common good." This is very well seen in the ancient town of Prestwick, near Ayr, where the burgesses are still called "freemen," and their share in the common lands is known as "freedom." In every case there was a market or fair, or a guild of merchants, or some such trading association connected with the burgh, but the essence of a burgh constitution was the possession of lands and privileges in the hands of the freemen, who alone had any right to the burgh property and to a share in its government. A burgess had to hold at least a rood of land within the burgh—his "toft," as it was called—and to build a house on it. He took the oath of loyalty to the king or other superior, and to the company of freemen. As the original idea of the burgh was protection, the freeman was responsible for its defence; he had to provide his own arms, in proportion to his wealth, to keep them in good order, to turn out at least once a year at the "wapinschaw" or inspection, and whenever required to put down rowdies within the burgh or enemies without. The Glasgow burghers, for example, had to appear at wapinschaws with "hagbut, corslet, jack, spear, and steel-bonnet," all their own property, and the inspections were held on the Old Green. The armourer and the fletcher, or arrow-smith, were naturally very important craftsmen, and

Parliament in 1457 ordained that "a bower and a fledger" were to be established in the head town of every shire in order to bring Scottish shooting up to the famous English standard. The duties of the free citizen were summed up in the phrase, "scot and lot"—that is, he had to pay his share of the rates, and to take his turn to patrol and guard the town. Glasgow had no police till 1800, and the watching, lighting, and cleansing of the city were done by the citizens themselves in turn.

Burgh Courts

Justice was administered by the burgh-reeves or magistrates, but the regulations governing the life of the town were adjusted by the burgesses themselves at their mutes, motes, or courts. These were generally held in the open air, round the market-cross, a mound, a standing stone, or even some tree. They were held three times a year—the chief court after Pasch (Passover or Easter), the next after Michaelmas, when the magistrates were elected, and the third after Yule or Christmas. Every burgess was bound to attend; by-laws and regulations were amended, new members admitted, and the ceremony generally concluded by a procession round the city boundaries to see whether the boundary marks had been tampered with. This custom of "riding the marches" still continues in many Scottish burghs, and till recently the quaint practice was observed of whipping some boys at each boundary stone, to impress its exact position upon the memory of the rising generation—a relic of the time when written deeds were scarce and tradition counted for much.

The words "mote" and "mute" occur in several place-names, as Muthill near Crieff and Moothill or Moteland elsewhere, while in the Isle of Man the ancient practice of the meeting of the Tynwald or open-air parliament, composed of all electors, at the Tynwald Hill, is still observed in July, when all new laws are proclaimed.

Unfree Men and Bondsmen

Besides the governing body of freemen, there were the unfree or landless men, who had no privileges. They had to perform the same duties of walk and ward, scot and lot, but they could not buy or sell within the town or carry on any trade—and could not even occupy the same part of the town gaol as the freemen!

Lower still in the social scale were the thrylls (thralls) or bondsmen, who were bound to the soil and sold with it like so many cattle. These represented the original slaves of the English—conquered Britons and Picts—and in country place-names wherever an Engliston (English town) occurs there is sure to be a Boreland (boor-land) not far off. In the case of salters—workers in the salt-pans along the coast, which gave their names to such places as Saltcoats and Prestonpans—this state of slavery continued till 1775, and was not finally abolished till 1799. The collier was practically a slave; he was sold along with the coal-pit, and if his sons or daughters once went to work in the pit they were "thirled" to it for life; if he ran away he could be punished as a common thief for stealing a body which was the property of his owner. Even his infant children were often bound over to a master at their baptism, in the presence of the minister and neighbours as witnesses, and a collier in debt often paid it by selling the freedom of his child. In return, the master had to keep the collier all his days, in work or in idleness, in health or in sickness, and provide him with a coffin when he died! The "freedom" of a burgh meant something in those days.

Merchants and Craftsmen

The burgesses themselves were of two classes, the merchants and the craftsmen. In Glasgow to-day the Trades House is composed of representatives from the fourteen incorporated crafts or trades, and their president, the Deacon-Convener of the Trades, sits in the City Council by right of

his office. In like fashion the Merchants' House has as its head the Lord Dean of Guild, who also is a member of the Council and presides over the Dean of Guild Court, the main functions of which are concerned with town-planning, laying out new streets, and regulating building operations generally. In burghs of barony the magistrates were at first nominated by the baron or overlord, and in the case of Glasgow by the bishop; royal burghs had the right of electing their own magistrates, a right which Glasgow did not possess till 1606, when the Duke of Lennox, as successor of the archbishops, was forced to renounce his right of nomination. The first provost of Glasgow was appointed in 1454, "an honorabyll man Johne Steuart, the first provost that was in the cite of Glasgow." From his time on, the official title of the first magistrate was "the Honourable the Provost of Glasgow"; now it is "the Right Honourable the Lord Provost." With the expansion of the city its division into wards became necessary, and there are now 37 wards returning three councillors each, making, with the Dean of Guild and the Deacon-Convener of the Trades, a total of 113 members.

Commons, Crofts, and Tofts

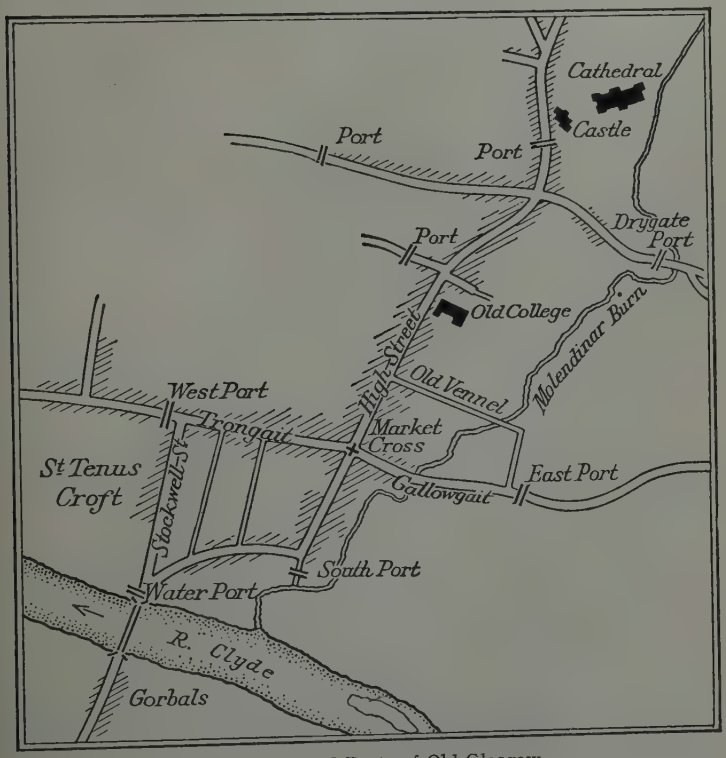
A traveller approaching the mediæval city would first pass through the open country which formed the common lands of the burgh, and gave grazing to the cows of the townsfolk. Such names as Boroughmuir, Barrowfield or Burghfield, Cowgate, and Cowcaddens still remind us of the ancient use of these districts. The town-herd of Glasgow had his house on the Green, and from it he went through the town every morning sounding his horn, collecting the cows from their several byres and driving them out to pasture, at first to the Green itself, and in later centuries by way of the Cow Loan (now Queen Street) and the Back Cow Loan (now Ingram Street) to the Cowcaddens on the north-western outskirts. Precisely similar proceedings may be witnessed to-day in any Swiss village.

Still approaching the town, our traveller would next arrive at the "crofts" or patches of ground cultivated by the burghers. These also gave rise to many place-names which still survive, especially in old maps and title-deeds of the seventeenth and eighteenth centuries—names like Croft-head, Croftbank, St. Tenaw's Croft, the Pallioun Croft, St. Ninian's Croft in the Gorbals, and the Windmill Croft, where Glasgow's first dock, the Kingston Dock, was made in 1867. His further progress would be arrested by the palings or hedges which marked off the "tofts" or gardens of the burghers, unless he entered by the public highway, in which case he would be halted at the "port" or gate. The Nether Barass Yett was at the end of what is now the Saltmarket, then the Waulkergait, and at the junction of Bell's Wynd and Candleriggs stood a very handsome gate which was only removed about 1735.

Old Roads and Streets

Glasgow had no walls, nor indeed had any town in Scotland except Perth, and possibly for a short time Inverness. Edinburgh was partly protected by an ancient wall which was extended in 1450, and owing to the scare which followed the disaster of Flodden a still more extensive wall was hurriedly run up in 1513, portions of which are still to be seen, but Glasgow was never confined by defences, and the ports were gradually moved out as occasion demanded. The main approaches to the city on the east were the Gallowgait, with the East Port, where the Saracen Buildings now stand; farther north the Roman road from Bellshill by way of Duke Street crossed the Molendinar at the East Brig, passed through the Drygait Port up the street of that name to the Wyndheid, the ancient centre of Glasgow, and continued to the west by the Rotten Row to the Bishop's Mill at Partick and the end of the Roman wall at Kilpatrick. From the north came in a road past the chapel of St. Roche (now St. Rollox) through the Stable Green Port, down the High Street to the Market Cross, then down the Waulkergait (now Saltmarket), and

along the Briggait to the river at Bishop Rae's bridge, where the Water Port blocked the way. From the Cross a street ran west, the Trongait, so called from the tron or public weighing-machine which stood there, and up till 1751 was



The Streets and Ports of Old Glasgow.

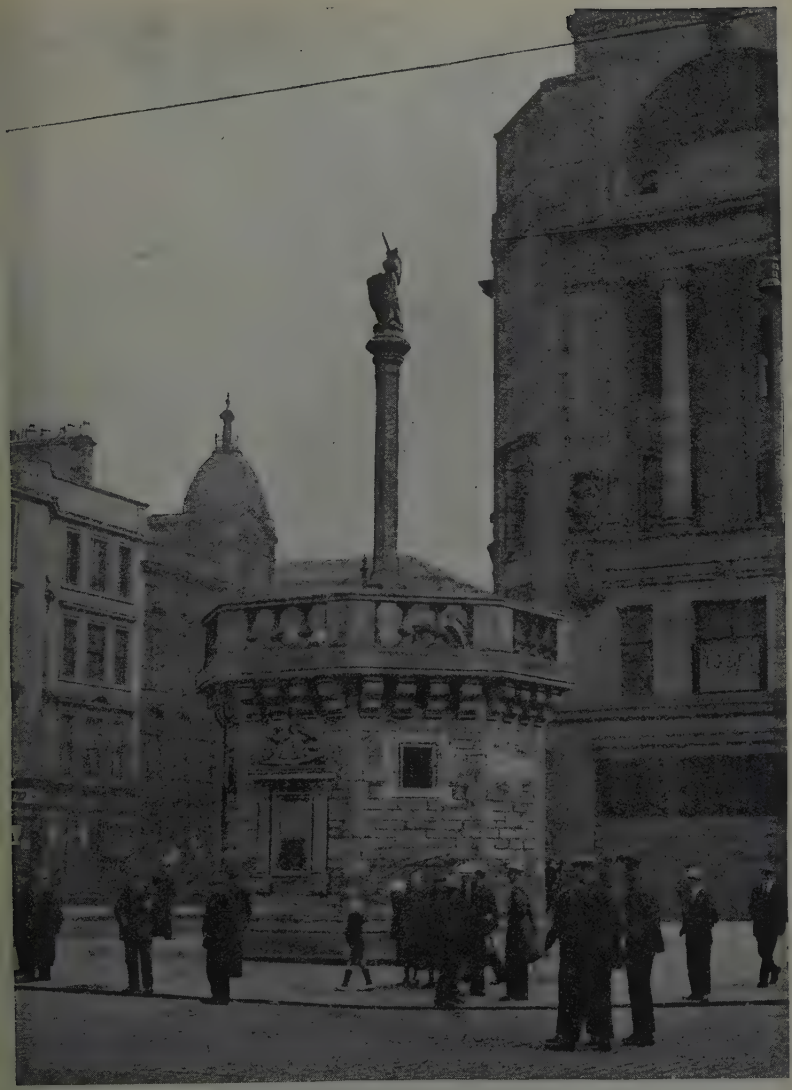
barred by the West Port at the Stockwellgait ; this road led past the Stake or Stock Well down to the Clyde at the Water Port, which was built by the Covenanters in 1639 as a defence against Charles I. The western portion of the Trongait, now Argyle Street, was known as St. Tenaw's Gait, and led to her tomb and chapel in what is now St. Enoch's Square.

The Market Cross

The original cross of St. Kentigern, the focus of early Glasgow, stood at the Wyndheid, now Infirmary Square, where the Roman road crossed the High Street; but as the city grew towards the river the centre of business was moved to the Market Cross, the present Glasgow Cross. Here stood the Town Hall with its Tolbooth, at first a place for collecting toll and taxation, combined with a prison for offenders; its steeple still remains in naked isolation. Here the public market was held, but none could buy or sell before the presiding magistrate had declared it open by trump and drum; here public proclamations were made, and the burghers were assembled for police duty, or, in unsettled times, for defence of the town; here offenders were placed in the stocks, whipped at the post, or otherwise corporally punished, while murderers were carted out by the Gallowgait to the place of public execution outside the city gate, where the barracks long stood, now the mineral terminus of a railway. By 1650 the city map shows a continuous line of buildings from the Cathedral to the river, and from the East to the West Port, with lines of streets to the north and south of the Trongait—the wynds of later days, where the burghers built upon their "tofts" or long strips of garden.

Dirt and Disease

There was no sanitation of any kind; filth was thrown into the open street, to be washed away more or less by kindly showers, or to remain as festering mud. The stench of a mediæval city ascended unto heaven, and the answer came down in plague. In Edinburgh, even as late as 1773, Dr. Johnson remarked to Boswell, "I can smell you in the dark," and the traditional "Flowers of Edinburgh" never grew in fields. Glasgow, not being confined by walls, was more openly built and less densely peopled, and was therefore comparatively free from plague. The last great



THE MARKET CROSS AS IT IS TO-DAY.
(Photo: George Outram and Co., Ltd.)

outbreak of plague struck Scotland in 1645, reached Glasgow in the following year, and lasted till 1648. The favourite saint whose protection was invoked against pestilence was St. Roche or St. Rollox, whose chapel stood on the north road just outside the gate, and in whose cemetery plague victims were buried. Another dirt disease of the time was leprosy. Robert Bruce himself was a leper; he founded a leper hospital at Kingcase in Prestwick, and died of the disease at Cardross Castle in 1329. Shortly afterwards Marjory Stewart, wife of Sir Duncan Campbell of Lochow, founded and endowed a leper hospital in the Gorbals, dedicated to St. Ninian; this building was in existence down to 1730.

The toleration of dirt was characteristic of the Middle Ages all over Europe. St. Kentigern and the early missionaries were famous for their excess of cleanliness; a daily bath indeed became a religious rite, a kind of sacrament, the outward visible sign of an inward spiritual grace. Bathing was an early English practice, but it seems to have gone out of fashion after the Norman Conquest, and for the next seven hundred years people seem to have mortified the flesh in the most literal fashion by systematic neglect, resulting in dirt and vermin. Ivanhoe and Marmion, Douglas and Graeme all objected to washing, and as late as the sixteenth century Queen Marguerite of Navarre, the celebrated wit and story-teller, showed her hands, saying how beautiful they were, "although I have not washed them for a week." Nowadays we have changed all that, but there are still too many mediævalists among us whose motto is "the clartier the cosier," and who need to be sharply reminded that cleanliness is next to godliness. In a city with the finest water-supply in Europe—seventy gallons per head per day—there may be some excuse for poverty, but there is certainly none for dirt.

The natural cure for plague was fire, and the wooden houses of the period, with their overhanging stories, lent themselves to this thorough but expensive method of cleansing. The plague of 1647–48 was followed in 1652 by a great fire, in

which one-third of Glasgow was burned. In consequence of this the city got its first fire engine in 1657, described as an "ingyne for casting water on land that is on fyre." The town drummer or the bell-ringer was the only fire alarm, and the water used for quenching fires had to be brought either from the river or from private wells. Thirty of these were still in use in 1816, and some, as the Lady Well, have persisted to this day. The drum was also used as an alarm clock to waken people in the morning, for clocks were of late invention and expensive.

Burgh Revenues

The revenues of the town were drawn from several sources. First of all came entry money, purchase of freedoms, fees for admission to the guild of merchants or to one of the trades, and fines of various kinds. Secondly, the burgh levied charges or tolls for the use of the bridge and the markets, and also took toll of all goods coming into the town for sale. Thus all merchants bringing herrings to the Broomielaw for sale had to send a sample to the river bailie for inspection, and as these samples were generally of superior quality a first-class herring came to be called a "Glasgow magistrate," a name still in use. The visitor to Paris may notice on the main roads the barriers or gates which mark the city boundaries, at each of which the customs officers of the city are to be seen, sampling all goods which enter the town, opening hampers and bags, and probing loads of hay with long lances to see if any dutiable articles are hidden within. These local customs duties were a feature of every mediæval town, and Glasgow was no exception. From every sack of grain, malt, flour, and meal the town officers took a ladleful (about a quarter of a peck) and a certain proportion, generally one out of each basket, from such articles as eggs, potatoes, fish, and cheese. These were called "ladle dues," and the money got from them was spent on keeping the streets in good order, so that this toll was sometimes called "gait dichting," or street cleansing. The third source of revenue came at a

later date, when the town became commercial and industrial rather than agricultural. The gardens of the burghers were gradually built upon, producing the wynds and slums of our own times ; as the town spread beyond its earlier limits, the crofts were sold and broken up into feus for building purposes ; and last of all the common lands or pastures, no longer required for the cows of the citizens, were let to farmers, sold outright, or feued as building sites. Most towns have in these ways parted with their original lands. Renfrew still draws a fair income from hers, but Glasgow retains only a few patches, 153 acres in all—namely, part of the Old Green, a strip of about half an acre between Victoria and Albert Bridges, another patch north of Alexandra Parade, and the minerals in Hamilton Hill, part of the old Wester Common. Other things than lands now figure in the " Common Good " of the city accounts, and the total value now stands at about £5,500,000, all but half a million of which is represented by the tramway system; but even this huge sum is only a fraction of the city's total assets, which run to over £40,000,000, with debts of £26,000,000.

Chapter VIII

STRESS AND STRAIN—WALLACE

Death of Alexander III.

The last year of Alexander III.'s reign was full of foreboding. His last surviving son, Alexander, Prince of Scotland, had died leaving no children, and soon afterwards came news of the death of his daughter Margaret, Queen of Norway, whose little daughter, Margaret the Maid of Norway, was now his only direct descendant. It was thought prudent to secure the succession to the throne by a second marriage, and accordingly Alexander married again in 1284. During the wedding rejoicings at Jedburgh a pageant was performed, the first ever recorded in Scotland, and in it one of the performers, dressed as a skeleton, acted the part of Death, filling the whole assembly with superstitious dread. Great thunderstorms in December were thought to foretell the fall of princes, and on the 19th of March 1286 there broke the storm which was to change the whole current of Scottish history. According to a well-known story, Thomas of Ercildoune, commonly called Thomas the Rhymer, had prophesied to the Earl of March and others that this day would be the stormiest that Scotland had ever seen. The day arrived, and seemed as far removed from storm as well might be, and the nobles were laughing at Thomas for the failure of his prophecy, when news arrived that King Alexander had been killed by a fall from his horse at Kinghorn. "There," said Thomas, "is the storm which I meant; and there never was tempest fraught with more ill-luck to Scotland."

The king's death has given us the oldest piece of our

Lowland Scottish literature, the lament quoted by Wyntoun in his *Chronicle* :

" Quhen Alysandyr oure Kyng wes dede
That Scotland led in luwe and lé,*
Away wes sons † off ale and brede
Off wyne and wax, off gamyn and glé ;
Oure gold wes changyd in to lede.
Cryst, borne in to Virgynyté,
Succoure Scotland, and remede,
That stad is in pirplexyté."

The Struggle for Independence

Then followed five hundred years of disturbance and unrest, marked by English invasions, Scottish risings, Bishops' Wars and Douglas Wars, king's men and queen's men, Highland reivers and Borders raiders, clergy against laity, Covenanters against prelatists, Montrose and Cromwell, Pretenders, Old and Young ; and it is doubtful whether during this half millennium Scotland had more than fifty years of settled government.

Most of this political storm left the West untouched ; the main line of English invasion was by way of Berwick and the Lothians or by Tweeddale, and if marauding bands did enter by Carlisle they contented themselves with the destruction of such fortresses as Lochmaben and Caerlaverock, rarely penetrating into Clydesdale. There were no big towns in the West to plunder, and even as late as Queen Mary's reign Glasgow was only the eleventh town in Scotland. In three crises of our national history, however, Clydesdale had a full or even a leading share—the struggle for independence, the Marian troubles, and the Covenants.

At the time of Alexander III.'s death Robert Wishart was Bishop of Glasgow, a notable man. Appointed one of the guardians or regents of Scotland on the death of the Maid of Norway, he had sworn homage to Edward I. of England

* Love and loyalty. † Plenty.

when John Balliol was deposed in 1296, but supported Wallace when that chieftain rose in revolt. After the surrender at Irvine he again submitted to Edward and was imprisoned in Roxburgh Castle, his own castle in Glasgow being committed to Antony Beck, the fighting Bishop of Durham. When Bruce stabbed Comyn in Dumfries it was Wishart who brought him to Glasgow, absolved him from the crime, took him to Scone and got him crowned, using some of his own episcopal dress for coronation robes. He was captured by the English after the battle of Methven in 1306 and again imprisoned, and was not released until after Bannockburn in 1314, a broken man, old and blind. He died soon after seeing Scotland independent; his tomb may still be seen in the undercroft or crypt of Glasgow Cathedral, and his name is borne by the street which now covers the oldest and most historic of Glasgow's underground streams.

Wallace

William Wallace, the darling of Scottish story, was the second son of Sir Malcolm Wallace of Ellerslie, now Elderslie, near Paisley, where he was born about 1270 in a house which is still standing. His great-great-grandfather, Richard Wallace, was a follower of Walter FitzAlan, and received from him lands near Kilmarnock, still known as Riccarton, Richard's town. In a time when most of the nobles and landowners were neither Scotsmen nor Englishmen but Normans, his name, William le Waleys or Wallace, that is, the Welshman or foreigner, would seem to indicate that he was of native British or Strathclyde stock; in any case the story of his life and work begins and ends in Clydesdale. A man of immense physical powers, he seems to have felt keenly the indignities to which the Scots were subjected by their insolent conquerors, and many tales are told of his personal interference, Moses-like, on behalf of his brethren. Many of these tales have been preserved in old histories such as those of Wyntoun and Fordoun, and more especially in the *Wallace* of Henry the

Minstrel, commonly known as Blind Harry; and although all stories tend to grow as they go, like snowballs, modern research has so far given support to many of these legends. It is much to be regretted that no good modern edition of Blind Harry's *Wallace* is now in existence; a book which inspired the patriotism of Burns and gave us the noblest lines of "Scots wha hae" could still have a message for his country. Jane Porter's *Scottish Chiefs*, though highly coloured, is still the best story of Wallace available.

Wallace had married Marion Braidfoot, heiress of Lamington on the upper Clyde, and had settled near Lanark. In a street brawl in that town some English soldiers were killed, and Haselrigg, governor of Lanark, whose son was one of those killed, went to arrest Wallace. Not finding the object of his search, who had sought refuge in the Cartland Crags, Haselrigg stabbed Wallace's wife, a crime speedily avenged by the murder of Haselrigg and the capture of Lanark castle. This proved the beginning of Wallace's public career, first as an outlaw, then as head of a party of revolt which grew with each separate success, and finally as chosen Guardian of Scotland. From their rock fortresses at Cora Linn and in the Cartland Crags, these Scottish Adullamites carried out systematic raids upon the English garrisons in the south of Scotland, their progress being aided by the absence of Edward I. in France and the illness of the Governor of Scotland, Warenne, Earl of Surrey.

One of these raids constitutes Glasgow's first battle. The Bishop's Castle of Glasgow stood near the site of the present Royal Infirmary, at the head of the High Street, then much steeper and narrower than it is to-day, and it was held by English troops under the command of Bishop Beck of Durham. Wallace and his men crossed the Clyde by a wooden bridge at the Stockwell, advanced up the steep slope, and were met by the garrison at the "Bell o' the Brae," where George Street crosses the High Street. At the same time Wallace's uncle, the laird of Auchinleck, had taken a party round from the east by the Drygait, and when the garrison left the castle

WALLACE'S MONUMENT AND BIRTHPLACE (*on the left*), ELDERSLIE.
(*Photo: Valentine and Sons, Ltd.*)

undefended and came out to meet Wallace they found their retreat cut off. Beck fled to Bothwell Castle, then also in English hands, and Wallace destroyed the Castle of Glasgow, on the principle adopted by Bruce, and confirmed by modern warfare, that fortresses are only a trap for those who hold them.

The Barns of Ayr

Another outstanding incident in the recovery of the West is the stern tragedy of the Barns of Ayr. During a time of truce Sir Aylmer de Valence, governor of Ayr, had invited a large number of the Scottish nobles and gentlemen to confer with him on the state of the district; but his motives were wholly treacherous, for as each man arrived at the place of meeting he was seized and hanged from the beams of the conference hall. The news was brought to Wallace, whose own uncle, Sir Reginald Crawford, was one of the victims, and immediately he took summary vengeance. Having collected his men in a wood near Ayr he learned that the English were celebrating their victory by a feast in that very hall, and had so little suspicion of trouble that they had not even set the usual guards. The Scots surrounded the place, fastened the doors on the outside, then set the whole structure on fire. None escaped, for there was no quarter for treachery; even those who had been lodged in a neighbouring convent fared no better, for the prior, learning what was on foot, armed his monks and killed most of the English guests, a treatment known long afterwards as "The Friar of Ayr's blessing." Such was the burning of the Barns of Ayr, June 18, 1297.

Betrayal and Execution of Wallace

The battles of Stirling, Falkirk, and Roslin belong to general Scottish history, but the closing scenes of Wallace's career have again a local connection. After the battle of Falkirk Wallace resigned his position as Guardian of Scotland; we then find him in France seeking help from Philip IV.,

TOWER OF OLD PARISH CHURCH, RUTHERGLEN.
(Photo: Valentine and Sons, Ltd.)

but in 1305 he was back in Clydesdale, and there he was betrayed and captured. In the Main Street of Rutherglen there still stands the tower of the old parish church where a truce had been concluded in 1297 between Aylmer de Valence and Wallace. It was in this same church that the traitor, Sir John Menteith, now struck a bargain with the English to seize Wallace:

> "A messenger Schir Aylmer hes gart pass
> On to Schir Jhon, and sone a tryst has set,
> At Ruglan Kirk, yir two togydder met."

The actual capture was made at Robroyston, to the east of Glasgow, where a monument marks the spot, a few hundred yards from Wallace's Well. The house was surrounded by his enemies, Wallace and his faithful companion being asleep and unarmed at the time; and it is said that the traitor gave the signal to his accomplices by placing the loaf on the table upside down. Even to this day the name of Menteith is held in execration, and it is considered very bad form to invert the loaf when one of that name is at table. Wallace's companion was killed outright; he himself was conveyed to Dumbarton Castle, on August 5, 1305, and thence to London for trial and execution. The traitor was rewarded by being made governor of Dumbarton Castle, the chief royal fortress in the West.

Chapter IX

CROOKSTON AND LANGSIDE

The Times of Queen Mary

THE torch which fell from the dead hand of Wallace was not extinguished; it was raised anew by Robert Bruce, to whom Wallace had looked as the rightful champion of Scottish freedom, and was carried in triumph to the goal. The troublous times which were covered by the reigns of the Bruces, Robert and David, and by the succeeding Stuart kings, belong to the general history of Scotland, but with the reign of Queen Mary the western districts again come into a place of prominence in the story.

It is a far cry from the time of the Maid of Norway to that of Mary, Queen of Scots, but in spite of the lapse of nearly three centuries the circumstances of both periods were very much alike. In both cases the heir to the Scottish crown was a young girl, in Mary's case an infant six days old; in both cases there was in England a powerful self-willed king eager to annex Scotland to England, and prepared to do so in the same way, by marrying the English Prince of Wales to the Scottish queen, or, failing that, by force. In both cases the haughty claim to the overlordship of Scotland was advanced, and in each case, to their shame, there were found plenty of Scottish nobles willing to acknowledge this claim. Finally, the failure of the marriage negotiations was followed as before by years of ruthless war, in which the south-eastern counties of Scotland were reduced to a desert; it was English invaders, and not Scottish reformers, who

destroyed the abbeys of Jedburgh and Kelso, Dryburgh and Melrose, and the English leader himself states that their destruction was entrusted chiefly to Spanish and Irish mercenaries, for the men of the English Border were horrified at the savagery displayed. Two important differences, however, distinguish the sixteenth-century troubles from those of Edwardian days: there was no Wallace to champion the national cause, and instead of a united Church there was the great religious upheaval known as the Reformation.

Divisions in Scotland

All through Queen Mary's reign the people of Scotland were divided by a double cleavage, based on politics and on religion. Under Henry VIII. England had become Protestant after a fashion, although the change was in its origin political rather than religious; it was also a change imposed upon the people from above, and not, as in Scotland, a national religious movement originating in the mass of the people themselves. The anti-Roman policy of Henry was continued by his successors, Edward VI. and Elizabeth, and the short and sinister reign of Mary Tudor only intensified the bitter hatred of Rome and intolerance of all foreign interference, whether in Church or State.

Scotland, therefore, was cleft along cross lines. The leading Roman Catholic clergy were keenly alive to the English danger which threatened the Scottish Church as well as the Scottish State. They were thus the champions not only of the old religion but of the national party, and their policy was all for strengthening the old alliance with France. On the other side the common people, while keenly patriotic, were by no means inclined to support the clergy, and favoured the Reformation doctrine in increasing proportion, especially in the south-west of Scotland and the Midland Valley. The nobility also were divided; the majority, it is unpleasant to record, played a purely selfish game, and plotted and counter-plotted, now with England, now with France, and always

ST. MUNGO'S CATHEDRAL, GLASGOW.

(Photo: Valentine and Sons, Ltd.)

with one another, and there was no one personality sufficiently outstanding to lead the nation, unless, indeed, John Knox be the name of him.

Queen Mary's Earlier Years

Queen Mary was born in Linlithgow Palace on December 7, 1542, but owing to the English invasions she was removed first to Stirling Castle, then to Inchmahome, an island in the Lake of Menteith (Scotland's only "lake"), where she played with her "four Maries" till she was in her sixth year; then a French fleet, sailing round by the Pentland Firth to escape the English cruisers, cast anchor off Dumbarton Castle and conveyed her safely to France. There she remained till August 1561, the star of the French court; in 1558 she married the Dauphin, and six weeks later entered upon her short reign of a year and a half as Queen of France and of Scotland. Although she was merely heir-apparent to the English crown, she also assumed, for a time, the arms of England, thus claiming a triple crown—a claim which made Queen Elizabeth her implacable and deadly enemy.

During her absence events had moved fast in Scotland. The new doctrine spread over all the land except the north, and nowhere obtained a firmer hold than in the south-west. The storm centre of Scotland was Edinburgh, where the absence of any competent statesman or soldier was balanced by the return of John Knox from exile in 1559. Under his influence the people rose in city after city and "cleansed" the cathedrals and churches of what they considered idolatrous monuments—altars, statues of saints, and the like—and there is no doubt that in many cases the "rascal multitude," as Knox calls them, showed a zeal which was certainly not according to knowledge. Only two cathedrals came out scathless after such a rough purification—those of St. Magnus in Kirkwall and St. Mungo in Glasgow. The story of the preservation of the latter, as told by Andrew Fairservice in Scott's *Rob Roy*, is worth repeating, as showing that blending

of zeal with discretion which is characteristic of the western temperament:

"Ah, it's a brave kirk, nane o' yer whigmaleeries and curliewurlies and open-steek hems about it—a' solid, weel-jointed mason-work, that will stand as lang as the warld, keep hands and gunpowther aff it. It had a'maist a douncome lang syne at the Reformation, when they pu'd doun the kirks of St. Andrews and Perth and thereawa', to cleanse them o' Papery, and idolatry, and image-worship. . . . Sae the commons o' Renfrew, and o' the Barony, and the Gorbals, and a' about, they behoved to come into Glasgow a'e fair morning, to try their hand on purging the High Kirk o' popish nicknackets. But the townsmen o' Glasgow, they were feared their auld edifice might slip the girths in gaun through siccan rough physic, sae they rang the common bell, and assembled the train-bands wi' took o' drum. By good luck, the worthy James Rabat was Dean o' Guild that year —and a gude mason he was himsel', made him the keener to keep up the auld bigging—and the trades assembled and offered downright battle to the commons, rather than that their kirk should coup the crans as others had done elsewhere. It wisna for love o' Papery—na, na!—nane could ever say that o' the trades o' Glasgow. Sae they sune cam to an agreement to tak a' the idolatrous statues o' sants (sorrow be on them) out o' their neuks—and sae the bits o' stane idols were broken in pieces by Scripture warrant, and flung into the Molendinar burn, and the auld kirk stood as crouse as a cat when the fleas are kaimed aff her, and a' body was alike pleased. And I hae heard wise folk say, that if the same had been done in ilka kirk in Scotland, the Reform wad just hae been as pure as it is e'en now, and we wad hae mair Christian-like kirks."

The Queen's Return: Crookston Castle

Mary returned to Scotland on August 19, 1561, a young widow of eighteen, and the most charming personality in Europe. She immediately became the focus of many intrigues,

CROOKSTON CASTLE.

(Photo: Valentine and Sons, Ltd.)

religious, political, and matrimonial. Several admirers lost their heads over her, some in the most literal sense, like Sir John Gordon, second son of the Earl of Huntly, and Chastelard, the French musician and poet. Her own choice fell upon her cousin, Henry Stewart, Lord Darnley, eldest son of the Earl of Lennox, the leading potentate of the west of Scotland, and like Mary herself a grandchild of Margaret Tudor, sister of Henry VIII., and therefore next heir after her to the thrones of England and Scotland. An unfounded tradition has long associated the brief courtship of Mary and Darnley with Crookston Castle, now in ruins, standing on the Cart, midway between Glasgow and Paisley, and not far from Darnley village; it was only in 1816 that Sir John Maxwell removed the remains of the fine old yew tree, long known as the Crookston Tree, which stood in the garden to the east of the castle, and was said to have been a favourite haunt of the lovers. Portions of it are still preserved at Pollok House, one piece being formed into a model of Crookston Castle itself. Scott was led into the curious error, in *The Abbot*, of making Queen Mary view the battle of Langside from Crookston Castle. This is a physical impossibility, and he admits his error in a note, but justifies its being retained in the text of the book on the ground of the romantic associations of the place, "although it involves shifting the site of the battle somewhat to the eastward"—in reality, to the westward. The spot from which the battle was actually viewed is the Court Knowe, near Cathcart Castle.

Murder of Darnley: Carberry Hill

Another association of Mary with the Glasgow district is in connection with Darnley's illness. She married Darnley on July 29, 1565; on the 9th of March next year Rizzio was murdered at Holyrood, and then began that estrangement between Mary and her husband which was to end for him at Kirk-of-Field. Their son, afterwards James VI., was born in 1566, and was baptized in Stirling Castle; it was remarked

that Darnley was not present, though in the castle at the time. Soon afterwards he withdrew from the court to Glasgow, and while there in December of that year he fell ill of smallpox. He was then residing in his father's house at the Stable-Green Port, opposite the present gateway of the Royal Infirmary, and there Queen Mary came to see him on the 22nd of January, lodging near him, probably in the historic building now known as " Provand's Lordship." They had a heart-to-heart talk, with mutual accusations and explanations, and as he was now fairly convalescent Mary proposed to take him with her to have baths at Craigmillar, near Edinburgh.

When Mary left, Darnley called in his man, Thomas Crawford, of whom we shall hear more, informed him fully of what had passed at the interview, telling him to communicate with Lennox, and at the same time asking what he thought of the Craigmillar plan, in view of the fact that Darnley had houses of his own in Edinburgh. Crawford seems to have replied that the queen was treating her husband too much like a prisoner, and Darnley was of the same opinion.

Mary returned to Edinburgh, and Darnley was taken, not to Craigmillar, but to Kirk-of-Field, outside the city wall, an airy site now occupied by Edinburgh University, and there, on February 10, 1567, Darnley was strangled and the place blown up with gunpowder. In the subsequent trials of Mary for her connection with this tragedy, important testimony was given by Crawford, and was also found in the Glasgow letters, contained in a silver casket, having reference to Darnley's illness; but these are now regarded as forgeries by most authorities. The murder of Darnley was followed by her marriage with Bothwell, who was believed to be the instigator of the murder, and this gave a shock to the national conscience which compelled her surrender at Carberry Hill, and her abdication and imprisonment in Lochleven Castle.

Lochleven and Langside

On the evening of May 2, 1568, Mary escaped from Lochleven, under circumstances graphically related by Scott in *The Abbot*, and rode to Hamilton, where she found herself at the head of 6,000 men. Her intention was to move to Dumbarton Castle, then held on her behalf by Lord Fleming, to avoid a battle, and to seek help from France, and in the meantime to try to regain the confidence of her people. This wise plan was foiled by the Hamiltons, who now saw an opportunity of crushing the Regent, James Stuart, Earl of Moray, Mary's half-brother, the mainstay of the English and Protestant faction, and of obtaining for themselves the control of the queen. Moray was at Glasgow, waiting to discover Mary's route, and had his force of 4,000 men drawn up on the burgh muir, north of the Gallowgate, now the site of a railway mineral terminus, expecting that Mary would cross the Clyde by the fords at Cambuslang and Rutherglen. When, however, he learned from his scouts that the royal forces were keeping to the south bank of the river, he mounted his hagbut men—the riflemen of that day—behind his cavalry, and thus with extraordinary speed transferred his whole army to what is now the Queen's Park. They clattered over the great stone bridge of Bishop Rae and up through the Gorbals, and took up their position on the ancient British camp which gives its name to Camphill. Then facing east, they prepared to receive the queen's troops, who were advancing from Rutherglen by Hangingshaw round the base of Mount Florida.

Moray had lined the village of Langside with his hagbutters, and likewise the steep and narrow lane, quite a ravine at that time, now known as Langside Road, which leads from the Battlefield tablet up to the Monument. The queen's vanguard, 2,000 strong, commanded by Lord Claud Hamilton, in vain attempted to force this lane; they were met with a murderous fire which threw their ranks into confusion, and the survivors, endeavouring to breast the hill, found themselves faced by Moray's main force, the flower of the Border

pikemen. So stubborn was the struggle here, and so closely were the long pikes crossed and interlocked, that Sir James Melvil, who was present, says the discharged pistols never reached the ground, but lay on the spears where they had been flung. The Renfrewshire men on Moray's right were beginning to give way, but Kirkaldy of Grange brought up reinforcements, and Moray seized the critical moment to turn his defence into attack. At the same time the chief of the Macfarlanes, with two hundred of his Highlanders, broke in upon the shattered forces of the royalists with fearsome yells, and the retreat would have become a hopeless rout but for the generous action of Moray, who employed his cavalry under Grange for the merciful purpose of saving the fugitives.

The battle lasted only three-quarters of an hour ; on the Regent's side only a single soldier fell, while the queen lost three hundred slain. Many notable prisoners and ten pieces of cannon were taken. The first cannon-balls made in Glasgow were fired at Langside, and for the first time the thunder of artillery rolled along the Clyde valley, bearing in its distant echoes the fate of one queen and the reputation of another. Mary had watched the fight from the Court Knowe, near Cathcart Castle, as we have already stated. A thorn tree under which she stood was long called by her name, but it fell into decay at the close of the eighteenth century, and a stone slab bearing the initials " M.R." and the date " 1568 " now marks the spot.

Mary's Flight to England

On seeing the ruin of her hopes the queen turned again towards Hamilton by the way she had come. Tradition tells that she was nearly captured through her horse floundering in the Polmadie Burn, here called Mall's Mire, and nearer Rutherglen a place called the " Pants " is said to be named after the panting of her steed, while farther on, at the Din Dykes, two haymakers waved their scythes and threatened to take her prisoner. She crossed the Clyde at Carmyle Ford and galloped at full speed for Dumfries, never halting till she

reached Dundrennan Abbey, on the Solway, sixty miles away. Against the advice of her faithful adherents she crossed the Solway in her riding-habit, landed at Workington, and was handed over to Lord Lowther, governor of Carlisle. Her letter to Elizabeth, written from Workington, speaks for itself as to her plight, and concludes thus : " It is my earnest request that your Majesty will send for me as soon as possible, for my condition is pitiable, not to say for a queen, but even for a simple gentlewoman. I have no other dress than that in which I escaped from the field ; my first day's ride was sixty miles across the country, and I have not since dared to travel except by night."

After the battle of Langside, May 13, 1568, Moray returned to Glasgow, the citizens of which were his supporters, not only from their religious convictions, but also from their feudal relations with the Earl of Lennox, Darnley's father. In gratitude for the assistance which the Glasgow baxters (bakers) had given in supplying bread to his army he gave the Baxters' Incorporation a grant of the Bishop's Mill on the Kelvin at Partick, and the name Regent Mills remains to this day.

Capture of Dumbarton Castle

One by one the royal castles were lost to Mary's supporters, till there remained only Dumbarton and Edinburgh. The latter, held by Kirkaldy of Grange, who had turned " queen's man," held out till 1573, when it was reduced by a siege train from England. The capture of Dumbarton is one of those daring feats which are more common in romance than in sober history, and deserves more than a passing mention, not only on its own merits, but from the local connection of the chief actor. All through these civil wars Lord Fleming had held Dumbarton Castle for the queen, thus keeping open a back-door with direct access to France and the north of Scotland, both friendly regions. The attack on the castle was entrusted to Thomas Crawford of Jordanhill, one of Lennox's men, who had been with Darnley when the

queen's visit to Glasgow took place. Later on, as we have said, he was an important witness in the trial of Mary for the murder of Darnley, and as the nominee of Lennox he became Provost of Glasgow in 1577.

Crawford was fortunate in having the assistance of a man named Robertson, who had once been a warder in the castle and knew every foot of the rock, and with him he marched from Glasgow after sunset. The story is graphically told by Tytler, in his *History of Scotland*, to the following effect.

Crawford sent before him a few light horsemen, who prevented the spread of intelligence by stopping all passengers, and arrived about midnight at Dumbuck, within a mile of the castle, where he was joined by a hundred men. Here he explained to the soldiers the hazardous service on which they were to be employed, provided them with ropes and scaling-ladders, and advancing with silence and celerity reached the rock, the summit of which, 260 feet high, was fortunately involved in a heavy fog, while the bottom was clear. On the first attempt all was likely to be lost. The ladders lost their hold while some of the soldiers were upon them, and had the garrison been on the alert the noise must inevitably have warned them. The assailants listened, however, and all was still; again their ladders were fixed, and this time by the steel hooks catching firmly in the crevices they gained a small jutting-out ledge where an ash-tree had struck its roots. To this they made fast their ropes, and thus speedily pulled up both the ladders and the rest of their companions.

They were still, however, far from their object. They had only reached the middle of the rock, day was breaking, and when for the second time they placed their ladders, an extraordinary impediment occurred. One of the soldiers while ascending was seized with a fit, in which he convulsively grasped the steps so firmly that no one could either pass him or unloose his hold. But Crawford's presence of mind suggested a ready expedient; he tied the man to the ladder, turned its other side outwards, and thus easily ascended with the rest of his men. They were now at the bottom of the

DUMBARTON ROCK.

(Photo: Valentine and Sons, Ltd.)

wall, where the footing was narrow and precarious ; but, once more fixing their ladders in the copestone, Alexander Ramsay, Crawford's ensign, with two other soldiers, stole up. Being instantly discovered on the summit by the sentinel, who gave the alarm, they leapt down and slew him, and sustained the attack of three others of the guard until they were joined by Crawford and his soldiers. The weight of these, and their struggles to surmount it, now brought down the old wall, and afforded an open breach, through which all rushed in, shouting " A Darnley, a Darnley ! " Crawford's watchword, given evidently from affection to his late unfortunate master. The garrison were panic-stricken and did not attempt resistance ; Fleming, the governor, from long familiarity with the place, managed to escape down the face of an almost perpendicular cleft or gully in the rock, and passing through a postern which opened upon the Clyde, he threw himself into a fishing-boat, and passed over to Argyllshire.

In this exploit the assailants did not lose a man, and of the garrison only four soldiers were slain. Many prisoners of rank were taken, among them the French ambassador and Hamilton, Bishop of St. Andrews, in steel cap and shirt of mail. The latter was instantly brought to trial for the murder of Darnley, and of the Regent Moray in 1570, and was condemned and executed without delay. This capture of Dumbarton, in May 1571, gave a death-blow to all hopes of foreign intervention, and after the loss of Edinburgh Castle two years later no subject dared to acknowledge Mary as his sovereign. Legally, her reign ended with her abdication in Lochleven in the year 1567, but practically the queen's party only died out with Kirkaldy of Grange in 1573.

Chapter X

THE COVENANTS

The National Covenant: the Glasgow Assembly

THERE are two periods in the troublous centuries of our national history upon which every genuine Scotsman looks back with pride. The first is the struggle for national independence under Wallace and Bruce. The second is the longer and more painful struggle for spiritual independence, formulated by Knox and Melville before the face of princes, witnessed on a hundred hillsides all through the Killing Times, and finally triumphant in the Revolution Settlement of 1689, when the principles for which the Covenanters suffered became the law of the land, and the basis of all constitutional monarchies, here or elsewhere.

In all the religious troubles of the time, often culminating in open warfare, the south-west of Scotland had the lion's share. John Wiclif, the morning-star of the Reformation, died on the last day of 1384, and in the persecutions which followed, many of the Lollards, as his followers were called, found refuge in Ayrshire. As early as 1399 the Scottish Parliament passed an Act dealing with heretics; in 1407 James Resby was burned at Perth, and in 1422 another, name unknown, was burned in the diocese of Glasgow. In 1494, in the reign of James IV., no fewer than thirty Lollards from Kyle were summoned by Blacader, the first Archbishop of Glasgow. Partly through their own bold and scriptural answers, and partly owing to the king's favour (for some of them were his own familiar friends), the accused were liberated, though three of them seem to have been hanged at a later date. The burning of Patrick Hamilton at St. Andrews in

1528 made all central Scotland eager to know the reason why, and a certain John Lindsay, a friend of Archbishop Beaton, said to him, " My lord, if ye burn any more, unless ye follow my counsel, ye will utterly destroy yourselves. If ye will burn them, let them be burnt in how (underground) cellars ; for the reik (smoke) of Master Patrick Hamilton has infected as many as it blew upon." Under David Beaton the Cardinal, who succeeded his uncle the Archbishop, persecution became more intense, and among the victims were two Glasgow men—Russell, a friar, and Kennedy, a promising poet though only in his 'teens. Wishart, who had imbibed the Lollard doctrines in Ayrshire, was burned in 1546 ; but the Cardinal was murdered two months later, and the first series of martyrs for the faith ended with the burning of Walter Mill, an old man of eighty-two. Owing to the spread of the New Testament in English these early Protestants were known as *Testamentares* or *Christers*, by way of reproach, as the original disciples had been called *Christians* for a nickname.

Queen Mary, on her return from France, had found Scotland settled for Protestantism in religion and Presbyterianism in Church government. Her successor, " the wisest fool in Christendom," was obsessed by one idea, the Divine Right of Kings—that as the Lord's anointed he was head of both Church and State, King and Pope in one. When James VI. became James I. of England he found Episcopacy more to his mind than Presbyterianism, and adopted as his policy, " no bishop, no king." Episcopacy was established in Scotland, and the old stupid attempt was made of trying to abolish freedom of thought. Thirty-three years later the stool of Jenny Geddes in St. Giles' Church, Edinburgh, broke the slumbers of the national conscience. The National Covenant was signed in 1638 by all sorts and conditions of men, and on Wednesday, 21st November, there met in Glasgow Cathedral that great General Assembly of the Church of Scotland, under Alexander Henderson as Moderator, which in less than thirty days swept away the accumulated cobwebs of more than fifty years.

It is easy for the ignorant to sneer at the Glasgow As-

sembly, but the plain fact remains that it was a much more representative body than any Scottish Parliament which ever met. Of its 238 members 98 were elders of the Church, and these comprised 17 nobles, 9 knights, and 25 lairds, the fine flower of the Scottish nation in intellect and patriotism. Charles I. replied by war, but the Scots were prepared for that also, and when the king crossed the Tweed he found himself facing 12,000 men with 45 guns on Duns Law, and these were under the command of Field-Marshal Alexander Leslie, home from the Thirty Years' War in Europe, a great friend of the king, but a greater friend of Scottish freedom. Civil War had begun.

The Bishops' Wars

The king's plan was to raise an army of 30,000 men from the royalists in northern England, and to invade Scotland with these, while Hamilton, who had been his Commissioner at the Glasgow Assembly, was to sail with 5,000 men to the Forth, and there join with Huntly in an attack upon Edinburgh. Wentworth, afterwards Earl of Strafford, with an Irish fleet was to enter the Clyde; 10,000 Irishmen under the Earl of Antrim were to over-run Argyll and the West, and Hamilton's own men from Arran were marked for the rich lands of Ayrshire and Clydesdale. The elaborate scheme fell to pieces. Charles was held up at Duns; Montrose, then a zealous Covenanter, disposed of Huntly without striking a blow; Wentworth's attack on the Clyde was a failure; Hamilton certainly arrived in the Forth with twenty gunboats, but these soon became hospitals for his men stricken with disease, and his own mother patrolled Leith sands with a pistol to blow out the brains of her recreant son should he attempt to land. Thus ended the first Bishops' War. The second Bishops' War broke out in 1640, and the Scots invaded England, but by November of that year the famous Long Parliament of England had tackled the whole problem of Stuart tyranny, and the story belongs to English rather than to Scottish history, with one exception.

That exception was the dashing campaign of Montrose, now a king's man, although he had been the first to sign the National Covenant in 1638. His brilliant victories in the north finished at Kilsyth in August 1645, and Montrose marched on Glasgow, where he called a Parliament in the king's name. He had promised to reward his Highlanders with the plunder of the city, but the magistrates bought him off for £50,000 Scots, and he retired to Bothwell, and then to Edinburgh, but there plague stayed his hand. Vainly supposing that the Lowlands would support him, he sent an officer through the south-western counties to beat up recruits, with whom he might make up for the chance lost at Glasgow. His meteoric career finished in blood at Philiphaugh, and General David Leslie, the victor, promptly levied upon Glasgow a fine of £20,000, to balance, as he said, the sum they had "lent" to Montrose. Three of the leading prisoners taken at that battle were hanged in Glasgow.

Cromwell in Glasgow

The execution of Charles in 1649 was deeply resented by the Scots, who had no quarrel with royalty as such. They proclaimed his son as Charles II., and this caused a breach with England, which was followed by the invasion of Scotland under Cromwell in 1650. "Dunbar Drove," on 3rd September, Cromwell's lucky day, made him master of Edinburgh, and with his whole army he marched by Kilsyth to Glasgow, by this time the second city in the kingdom. As in Edinburgh, the ministers and magistrates had fled, and only two were left to face Cromwell, both belonging to the congregations which met in the Cathedral—Gillespie of the Outer High, and the famous Zachary Boyd of the Barony. Cromwell soon won over Gillespie, but Zachary was made of sterner stuff, and on the following Sunday he preached at Cromwell with such pointed vigour that Cromwell's secretary wanted to pistol the preacher during the service. The Protector knew his man and took another method; he asked Zachary to

supper, and then held family worship, concluding with a prayer which kept Boyd on his knees for four hours, and did not end till three in the morning. It is more grateful to record that on this visit Cromwell paid to the University Library not only a sum of £200 which Charles I. had promised and never paid, but in addition £500 of his own. Zachary Boyd himself was a man of note, a staunch Covenanter, a learned divine who had studied at Glasgow, St. Andrews, and Saumur, at which last university he declined a professorship; he then became minister of the Glasgow Barony, and rector and vice-chancellor of the university, which still possesses his bust and his manuscripts. He has come down to us as the writer of popular metrical versions of the Psalms, and of metrical paraphrases, mostly of poor quality, of other parts of the Bible. He was followed in the Barony by the saintly Donald Cargill, one of the martyrs of the Covenant.

Scotland had never been so well governed as it was under Cromwell, and in no department was this better seen than in the courts of justice. Indeed, the only complaint made against his judges was because of their impartiality: "A pack of kinless loons," said one of their successors, adding, "For my part I can never see a cousin or friend in the wrong." Glasgow shared in the general improvement; in one century it had advanced from the eleventh to the second place in Scotland, and in 1660 had a population of 14,678, fully three times what it was in Queen Mary's time.

The Restoration: the "Drunken Parliament"

The Restoration changed all that. Within five years Britain sank from the first place among the great nations of Europe to the lowest, her king a paid pensioner of France, Dutch guns booming in the Thames, and the whole standard of public life and private morals lowered beyond description. In Scotland it was worse, with "a Pharaoh on the throne, a Haman in the state, and a Judas in the church." On New Year's Day, 1661, the Scottish Parliament met in Edinburgh, under the

King's Commissioner, Middleton, formerly an ardent Covenanter and an officer under David Leslie, but now an earl, and the Duke of Lauderdale, another renegade, who was master of Scotland and its fate. This Parliament has come down to history as " Middleton's Drunken Parliament." According to Bishop Burnet, historian of the time, " it was a mad, roaring time, full of extravagance, and no wonder it was so, when the men of affairs were almost perpetually drunk." Within six months they passed nearly four hundred Acts, but even this was too slow, and at last they passed the Act Rescissory, abolishing at one stroke all Acts from 1640 to 1648. " When they had drunk higher, they resolved to venture on it, an Act only fit to be concluded after a drunken bout."

Then followed the executions of Argyll, Guthrie, and Warriston ; Samuel Rutherford received his summons when dying. " Tell them," said he, " that I have a summons already from a superior Judge and Judicatory, and I behove to answer my first summons ; and ere your day arrives I will be where few kings and great folks come." The king was made supreme in Church and State ; Episcopacy was re-established, " Sharp of that ilk," as Cromwell had shrewdly named him, being Primate of Scotland ; the Covenants were condemned, and all Presbyterian ministers who would not conform to the new order had to leave their churches. All the Glasgow ministers refused to pay homage to the new archbishop, and Middleton called the Privy Council to Glasgow to deal with this insubordination. They met in the College Hall on October 1, 1662, and passed what is known as the " Drunken Act of Glasgow," ordering all nonconformist ministers to leave their manses by 1st November. The only sober man in the council was Sir James Lockhart of the Lee, who protested in vain. The Duke of Hamilton himself told Burnet that " they were all so drunk that day, that they were not capable of considering anything that was laid before them, and would hear of nothing but the executing of the law, without any relenting or delay." The minister of the Outer High Church of Glasgow had already

been banished, and now Donald Cargill of the Barony, successor of Zachary Boyd, had to go into the wilderness along with three or four hundred others—a full third of all the ministers in Scotland. The churches in the south-west were vacant, and to fill them the " King's Curates " came from the north, whom Burnet describes as " the dregs and refuse of the northern parts, ignorant to a reproach, and many of them openly vicious." It was said that the farmers in the north could no longer get lads to keep the cows, as they had all got places as ministers!

Persecution of the Covenanters

Naturally, the people never went near these, so the Council passed " the Bishops' Drag-Net," with fines for non-attendance at church up to the extent of one-fourth of the rental, and no " outed " minister was allowed to live within twenty miles of his former church. This led to meetings in private houses or in the open fields, and the Council tried to suppress these by various Conventicle Acts, increasing in severity. Spies and informers were encouraged by receiving part of the heavy fines imposed, officers of dragoons were rewarded by grants of confiscated property, while the common soldiers had the plunder of homes for their share. The fires of persecution burned most fiercely in the three Covenanting counties of Lanark, Ayr, and Dumfries, and in these counties there is hardly a parish kirkyard that has not its martyrs' monument, and hardly a hillside that is not crowned with a Covenanter's cairn. No one was exempted by age, sex, or condition ; men and women alike were shot, hanged, or drowned ; girls in their teens, and boys not so old.

The most sacred spot in all Scotland is surely neither Whithorn nor Iona, but that place in the Grassmarket of Edinburgh where a cross in the causeway marks the site of the gallows which for many hundreds was the real Jacob's Ladder. According to many contemporary authorities, the number of sufferers for the Covenants reached 18,000. Of

these 1,700 were sold as slaves to the "Plantations," 750 were banished to the northern isles, 7,000 went into exile, 2,800 were imprisoned, 680 died fighting, 498 were killed in the fields, 362 were hanged, and many others perished in their wanderings and lie under nameless cairns. Although the "Killing Time" is a term strictly applied to the years 1684–85, when the Duke of York was viceroy in Scotland, the whole of the second Stuart period from the Restoration to the Revolution was one long-drawn agony. Aberdeen and the north had always been Episcopal or Roman Catholic even in Knox's time, and Edinburgh was coldly sympathetic towards the Covenanters, but in the Covenanting shires the fire kindled by the Lollards burned steadily, and thrice broke out into the flame of open rebellion.

The Glasgow area suffered severely. Fourteen of its ministers were thrust from their churches, the leading citizens were fined or banished, the city itself was heavily fined for countenancing Covenanters, and troops were placed at the gates to keep the citizens from attending conventicles on Sunday. To support the Privy Council the Duke of Lauderdale, in 1678, assembled at Stirling two or three thousand regular troops and six or seven thousand Highlanders in order to "crush the fanatics," as he said, "so that they may not trouble us any more." This "Highland Host" is described by Beveridge as savage, ill-clad, rudely armed, and almost uncontrollable. They were let loose on the south-western counties to plunder and slay at will. Scott himself, no warm friend of the Covenant, has to confess in the best tale he ever wrote: "It was just 'Will ye tak' the test?' If not, 'Make ready—present—fire!' and there lay the recusant." In Ayrshire alone these locusts reaped a harvest of £36,000, and when, at the end of three months, popular outcry secured their withdrawal, an eye-witness describes them as marching home over Stirling Bridge, every man with drawn sword as a conqueror, and with as much baggage as if they had come from the sack of a besieged city.

There was one bridge, however, which proved to them a

narrow way. Glasgow had 5,000 of these barbarians billeted on the citizens, whom they robbed and maltreated at their pleasure ; but when their recall was sounded, the students took the law into their own hands, occupied Glasgow Bridge, the only one then existing, and held up the Highlanders, making them disgorge as they passed in single file.

Rullion Green

Three times the peasantry of the west were goaded into rebellion. In 1666 a rising in Dalry, Kirkcudbrightshire, against the brutalities of Turner—" Bite-the-sheep "—was followed by a march by Dumfries to Lanark and Edinburgh under Colonel Wallace, a descendant of the Scottish hero. Edinburgh was hostile, and the little force was cut to pieces by Dalyell at Rullion Green in the Pentlands. Fresh severities followed this failure, among them the execution of Hugh McKail, and special Justiciary Commissions were held in Glasgow and in Ayr, where the hangman, though a Highlander, refused to act, even when threatened by Dalyell with the " boot."

Drumclog

The second armed rising was nearer home. Archbishop Sharp was sent to his long account on May 3, 1679, and on the 29th of the same month some seventy or eighty Covenanters rode into Rutherglen, extinguished the bonfires kindled for Restoration Day, publicly burned all the Acts against religious freedom, and made a formal protest at the Cross against all the doings of the Government since 1660. They would have marched on Glasgow, but it was garrisoned by troops under Lord Ross, and they retired to the hills beyond Strathaven. The task of putting down this fresh revolt was entrusted to Graham of Claverhouse, and three days later, having had news of a great conventicle at Loudon Hill, he advanced from Glasgow by Hamilton, where he captured fifteen suspects. These he bound and took with him to

Strathaven, which he reached at six in the morning of Sunday, 1st June. The result was the skirmish of Drumclog, in which the Covenanters lost one killed and five mortally wounded, whereas the dragoons left thirty dead on the field and other twelve in the flight. Claverhouse reached Glasgow that night, and was followed by the victors; but Lord Ross had barricaded the centre of the city, including the bridge, the whole garrison was under arms, and the Covenanters were repulsed in the "battle of the Gallowgate," Claverhouse giving orders that the dead bodies were not to be buried, but left to be eaten by the butchers' dogs. The Covenanters were reinforced—"The country," says Claverhouse in his dispatch, "was flocking to them from all hands"—and from 250 at Drumclog they grew to between 5,000 and 8,000. The Privy Council shared Claverhouse's view of the situation, ordered the Earl of Linlithgow and his regulars to join Lord Ross, summoned the Highland auxiliaries of Argyll, and received the Duke of Monmouth, an illegitimate son of the king, with English troops and guns. Linlithgow joined Ross at Kilsyth, but having only 1,800 men he withdrew to Stirling, and then to Edinburgh. The Covenanters then entered Glasgow, burned the houses of Lauderdale and the prelates, and removed from the Tolbooth the heads of those who had been executed for the rising of Rullion Green. Monmouth reached Edinburgh on 18th June, joined the army at Blackburn, and on the evening of Saturday, the 21st, he arrived at Bothwell Brig with 10,000 men.

Bothwell Brig

The story of the battle on the following day is well known, and is related with masterly and graphic detail by Scott in *Old Mortality*. Of the insurgents, whose numbers had been reduced by disputes to 4,000, some 300 were killed and 1,200 prisoners were taken to Edinburgh, where they were met with insulting cries by a jeering rabble. Fresh captures swelled their numbers to 1,500, and as no prison could hold them

BOTHWELL BRIG, SHOWING MONUMENT.

(*Photo: Valentine and Sons, Ltd.*)

they were confined in an enclosed corner of what is now Greyfriars churchyard, still known by their name. There they remained for months in the open, lying on the bare ground at night, receiving only a starvation allowance of food, and watched by sentries who had orders to shoot at sight any who attempted to escape. Many were hanged, and 257 were sentenced to be transported to the "Plantations" of North America; but these never reached their goal of slavery, for on 10th December the ship on which they sailed foundered off Deerness in Orkney. The captain fastened down the hatches, and when some of the prisoners managed to cut their way out they were thrown back by the crew into the wild sea, so that not more than fifty ever reached the shore. A tall monument at Scarvating tells where the drowned were buried. Similar monuments stand at Drumclog and Bothwell Brig, and at each of these the anniversary of the battle is celebrated by a modern conventicle on Covenanting lines, with an average attendance at the latter place of 20,000 to 30,000.

After this battle Claverhouse wanted to sack and burn Glasgow for favouring the rebels, but the humane Duke of Monmouth forbade. Claverhouse and Major White had given their votes for killing all the prisoners, but Monmouth gave a soldier's reply—he could not kill men in cold blood; that was only for butchers.

Airds Moss

Next year, on the anniversary of the battle, Richard Cameron and Donald Cargill, with twenty men, rode up to the old cross of Sanquhar and read a Declaration renouncing allegiance to Charles II. This was a declaration of war, and a month later the "Cameronians" were surprised at Airds Moss, near Muirkirk. Cameron was killed in the fight; Hackstoun of Rathillet, one of Sharp's murderers, was reserved for a more horrible death; Cargill escaped, but was captured later at Covington Mill in Clydesdale, and hanged in the Grassmarket.

Argyll's Rebellion

Five years later, at the close of the "Killing Time," Sanquhar heard another Declaration, this time by the Cameronians led by James Renwick, soon to be the last of the martyrs. The same year saw the ill-timed rebellions of Argyll and Monmouth, ending at Inchinnan and Sedgemoor respectively. Argyll sailed from Holland, reached Campbeltown on the 20th May, and sent round the fiery cross, calling the Campbells to arms. His small force came up the Kyles of Bute to Glendaruel, and he fortified a little island at the mouth of Loch Ridden, making it his arsenal. But he was in a trap; the English fleet was in his rear, and the path to Glasgow was blocked by a strong force on the mainland under Dumbarton and Douglas. He abandoned the arsenal, which was captured by the fleet, and marched east, with his company of 800 men fast dwindling on the road. They crossed the Clyde into Renfrewshire at Kilpatrick ford, and then broke up into small parties in order to escape more easily. Alone and disguised as a peasant, Argyll tried to pass the lines near Paisley; but some troopers saw him as he was crossing the Cart at Inchinnan, and there he was captured, sitting on the ancient stone called the Chariot of St. Conval, now more widely known as Argyll's Stone. He was beheaded in Edinburgh on June 30, 1685, and Monmouth underwent the same doom on Tower Hill, London, a fortnight later.

The Cameronians

Charles II. had died in February that same year, and his brother James, a more honest Roman Catholic, ascended the throne. His misgovernment mainly concerns English history, but at last the long-suffering English reached the same conclusion as Richard Cameron had proclaimed eight years earlier, and Knox had boldly asserted before Queen Mary a hundred years before—that it is not only lawful but just

that tyrants should be deposed by their subjects. Sweeping aside the petty quibbles of the English Parliament, the Scots boldly declared that James had forfeited his right to the crown, and that the throne had become vacant.

The Cameronians, well organized in societies, raised a regiment 1,200 strong at Douglas on May 14, 1689, and, led by Lord Angus and Colonel Cleland, one of the Drumclog men, they marched to Edinburgh to support the Scottish Convention of Estates in their offer of the crown to William and Mary. This famous regiment, not to be confounded with the Cameron Highlanders, was long known as the 26th, and later as the Scottish Rifles. It had fourteen battalions in the Great War, and has now resumed its historic name of Cameronians, and every year the local battalion at Hamilton parades at Bothwell Brig in commemoration of the battle. To this day at church parade they carry rifles and post sentries, a relic of the conventicles, and every Presbyterian recruit—and there are few others—is presented with a Bible, which has to be produced at every kit inspection. The Cameronians were too late for sharing in the fight at Killiecrankie in July 1689, but their opportunity came at Dunkeld, where the "Sacred Band," 800 strong, wiped out a force of Highlanders and Irish six times their number. They lost their colonel and fourteen men, but the Jacobites left 300 dead. This practically ended the Revolution in Scotland, though the final battle, really a rout, took place on May 1, 1690, when the Highland host, rallied for the last time, were swept away at the Haughs of Cromdale, near Grantown on Spey.

The Jacobite Rebellions

Glasgow was never Jacobite. When the rebellion of the 'Fifteen started, the city raised a regiment of 500 men for George I. Trenches were dug round the city, arms were procured for the citizens from Edinburgh Castle, the streets were barricaded, and guns from Port Glasgow were mounted in suitable positions. The battle of Sheriffmuir rendered

these preparations unnecessary, and the castle of Glasgow received 353 prisoners from that fight.

The 'Forty-five was a more serious affair for the city. When Prince Charlie occupied Edinburgh after the battle of Prestonpans he requisitioned Glasgow for £5,000 in money and £500 in goods. On his return from England during the retreat from Derby, he arrived in Glasgow with his hungry and ragged army on Christmas Day, and requisitioned 12,000 linen shirts, 6,000 cloth coats, 6,000 pairs of shoes, 6,000 pairs of hose, 6,000 waistcoats, and 6,000 bonnets, and in addition he fined the Provost £500. In a week his men were all dressed in their new clothes, and he reviewed them on the Fleshers' Haugh of Glasgow Green. Ten days later he marched north-east to Kilsyth, taking with him a couple of Glasgow bailies as hostages, but so unpopular was his cause that he was joined by only one recruit, a drunken tailor. Another who followed him was Dougal Graham the city bellman, who accompanied his army all the way to Culloden, and wrote a history of the Rebellion in doggerel verse, after the style of Blind Harry's *Wallace*. On the other side, it was one of Glasgow's sons who presented to the city the well-known statue of King William III. at the Cross; but it is not so generally known that the four guns at the corners of the pedestal were actually used at the Boyne.

The 'Forty-five did not end the Jacobite attempts to regain the throne. Scott in *Redgauntlet* tells the tale of the last one, made as late as 1765. Twenty years had not taught Charles anything; like the Bourbons a century later, the Stuarts had learned nothing and forgotten nothing. The feelings of his dearest friends were summed up by Macnamara in a last vain attempt to bring him to reason: "What has your family done, sir, thus to bring down the vengeance of Heaven on every branch of it through so many ages?" The Stuarts were a home-grown dynasty, and had a splendid start in Walter FitzAlan of Renfrew and Robert II., and historians have speculated in vain as to the origin of that evil heritage which ruined its later kings. Even to the

end, however, the ill-fated race exercised a magnetic power of attraction over its followers, and was served with a loyalty and devotion which rose superior to disaster and defeat. To this loyalty the history of Scotland owes some of its most romantic chapters.

Chapter XI

THE PORT OF GLASGOW

The River

"GLASGOW made the Clyde and the Clyde made Glasgow" is a saying so familiar that few people realize how literally true it is, and fewer still how recent has been the twofold process of making. A visitor from a land which need not be named was boasting of the great rivers of his country in contrast with this "rain-conductor" called the Clyde, when the canny Scot who was tolerating him remarked, "Ye needna bounce about them; Providence gave them to ye, but we made this ane oorsel's." It is hardly credible, though strictly true, that there are people still alive who have waded the Clyde at the Broomielaw, and the present writer was present as an uninvited guest at the opening of Glasgow's first dock, where once the windmill stood.

In early times, as has already been explained, the river was much broader than it is to-day; its gently sloping banks were not much above the water-level, and there were frequent winter floods which formed even permanent marshes. Timothy Pont's map of 1596, published in *Blaeu's Atlas* in 1654, shows quite a number of islands in the Clyde from Glasgow down to Erskine. All of these have now been merged in the banks, with the exception of Newshot Isle on the left bank, where the Cart comes in below Renfrew; but the names of some have survived, as in Whiteinch, King's Inch, and Abbot's Inch. A later map, made by the father of James Watt in 1734, shows seven or eight islands; the uppermost of these, a mere sandbank above the bridge, disappeared as the result of an earthquake in the eighteenth

THE ISLANDS IN THE CLYDE.

(From an old map.)

century. Flooding was extensive down to modern times. In 1712 the Clyde rose fully eighteen feet, and covered all the haughs or lower parts of the city up to the Cross. Seventy years later a greater flood took place ; the river rose twenty feet, and converted all the low ground from Uddingston downwards into something like the original sea-loch of the early Britons. Boats were used in the Trongate to rescue the inhabitants, and the flood-level is shown by a brass plate on the gaol at Albert Bridge, and also by a cut in the rock at Bothwell Castle, with the inscription " Clyde rose to this mark, March 11, 1782." This was a spring flood due to the melting of the snow in upper Clydesdale, but the flood of 1712 occurred in September, when floods are least expected, and so did greater damage. The *Scots Courant* of that date tells that there were at least 800 houses under water, and 1,200 families imprisoned in higher tenements. One young woman was washed off the street and drowned, two others were lost in the Kelvin, several thousand pounds' worth of goods and crops was destroyed, and Glasgow Bridge itself was severely strained. Glasgow at that date had only 13,800 people and a yearly rental of not quite £9,000, so that the damage must have been severely felt. The river channel from Cambuslang to the city is now all banked up, but as recently as 1900 these barriers were broken by another spate, and a good deal of the land near Rutherglen was laid under water. These haughs, or low-lying meadows liable to flooding, gave rise to such place-names as Kelvinhaugh, Provost's Haugh, Flesher's Haugh, and Sauchiehall, this last being a corruption of Sauchiehaugh, the meadow of the willows, then liable to be flooded by the natural drainage from Garnethill and Blythswood Hill.

Glasgow a Fishing Centre

From very early times Glasgow was a great fishing centre, especially of herring and salmon. Again and again there appear in old charters grants of so many herring nets and

salmon shots; one of these last, and a very profitable one, was opposite the Peatbog on Glasgow Green, another was on the south bank where the Terminus Quay now stands, and a third was at Govan. The herring fishery was carried on even up to the Broomielaw, and the herring itself was used almost as coinage, feu-duties and rents being paid in herrings. The beginnings of Glasgow's foreign trade are also found here. As early as the reign of John Balliol (1295) a treaty was made with France encouraging fishing exports from Scotland, and in 1420 William Elphinstone did a large business with France in curing and exporting salmon, while in 1500 Archibald Lyon, son of Lord Glamis and an ancestral connection of our present Duchess of York, was trading in salmon and herring with France, Holland, and Poland. Red herrings had been used in Scotland at least as early as 1424, but the credit of curing them on a commercial scale is due to a Glasgow merchant, Walter Gibson, Provost from 1687 to 1689, who set up the first kippering establishment at Gourock. Most of the numerous quarrels among the Clyde burghs, especially those between Glasgow and Dumbarton, were connected with fishing and trading rights, and were not finally settled till the year 1700. At that date the herring trade was both extensive and profitable, France alone taking 36,000 barrels in a single season. This same Walter Gibson was a great shipper, seeking trade in many quarters. He was the first to bring iron and dyestuffs direct to the Clyde instead of by way of Stirling and Bo'ness, and he earned an evil reputation by using his vessels to ship Covenanting captives to Barbados as slaves. The usual port in the west for overseas trade was Irvine, from which the goods were carried on packhorses to Glasgow.

Port-Glasgow

Apart from human selfishness, which enters into most quarrels, the disputes between the river burghs—Rutherglen, Glasgow, Renfrew, and Dumbarton—had a physical or geographical origin. In addition to the general shallowness

of the river, there was a very shallow ford at Dumbuck, where even as late as 1768 there was only a depth of three feet at high water. All water-borne traffic for Glasgow, therefore, had to be stopped below Dumbuck, generally at Dumbarton, and the cargoes transferred to lighters or gabbarts, flat-bottomed barges, and in this way conveyed first to the Broomielaw, and later, when the river was deepened, up to Glasgow Bridge at the Stockwell. Dumbarton was thus the earliest port of Glasgow, and tried again and again to levy a tax on the city's imports and on its exports of cured salmon.

Even with these handicaps, however, in 1597 Glasgow employed six vessels of its own, measuring 279½ tons in all, and four belonging to other burghs; and by 1606 the city is described in an Act of Parliament as having "gret trade and traffique, and weill peopled." The pier at the Broomielaw was made three years later, and in 1636 Charles I. granted a charter to Glasgow as a free royal burgh, including the use of the Clyde harbour from the city to the Cloch, with power to build ports, deepen the river, etc. Several attempts had been made to remove the Dumbuck shoals, but without success, and at last, in 1668, Glasgow approached Dumbarton with the proposal to establish a harbour there. It is curious at this time of day to read that Dumbarton rejected the proposal because of the great scarcity of food and consequent rise in prices which would follow on such a large influx of mariners into that town. Thus repelled at Dumbarton, the citizens went across the Clyde and bought some land from Sir Patrick Maxwell of Newark, and there they made their harbour—Newport Glasgow, now Port-Glasgow—which became later the site of the first graving-dock in Scotland, the work of James Watt. The extension of harbour facilities was followed by a corresponding extension of the fishing industry, which now included the capture of seals and whales; the whales, again, gave rise to soap-boiling and candle-making, at first in the Candleriggs, and in 1695 Glasgow had the only soap-works in Scotland.

Deepening the River

In the eighteenth century Glasgow began to take its harbour problem seriously. John Watt, father of the great engineer, drew for the city a couple of plans of Port-Glasgow, and also a map of the river and firth. Great engineers were asked to come and report on the Clyde. First came John Smeaton, who proposed to retain deep water in the harbour by building a lock two miles above Renfrew. Then came a notable scheme by John Golborne of Chester, and one which had a success beyond his calculations. In 1768 he proposed to make the Clyde deepen itself by the natural scour of the current, and in order to secure a greater force of water he narrowed the channel by building jetties at several points. His contract was to deepen the channel to six feet at the Dumbuck Ford, even at neap tides, and he actually made it ten inches deeper, so that vessels drawing more than six feet of water came up to the Broomielaw. Later reports by Watt and Rennie confirmed the soundness of Golborne's plan. The obstacles which were not scoured away by the current were removed by dredging, and the silt was deposited on the shallow banks, so that all the islands were gradually joined to the mainland. Later still, Rennie connected the ends of Golborne's jetties by a continuous wall, and behind this the silt from the dredgers was deposited, making an artificial bank as far down as Renfrew. A relic of these walls may still be seen in the Long Dyke, which extends for two miles along the south side of the present channel from Dunglass Castle to Dumbarton Castle.

One effect of these operations was to shift the river channel to the north, and Renfrew was now left half a mile inland, as the King's Inch had been joined to Renfrewshire and the river confined to the north side of it. A canal was therefore made on the old bed of the river to allow ships to unload at Renfrew, another canal on the opposite bank at Yoker to connect with the Forth and Clyde Canal, and a third at the mouth of the Cart to provide Paisley with a harbour. The

second of these is now out of use, but the Renfrew Canal, or Pudzeoch, serves as a dock for the Clyde Trustees, whose works stand on its banks, and the Cart Navigation is promising well, though it has not yet made Paisley a port.

The Harbour

It was Telford who made the towing-path from Glasgow to Renfrew, for he found that while the lighters from Port-Glasgow could sometimes sail right up to the Broomielaw, they were often becalmed at Elderslie owing to the " blanketing " action of the woods there. Foreign merchants still chartered vessels from the Potterig, opposite Dumbarton, and from lower down, and it shows the " tricky " nature of the channel that " fliers "—flat-bottomed barges—sometimes sailed from Glasgow to Gourock in twenty-four hours or less, while they might at other times take three days to reach Port-Glasgow. It was Telford, also, who first proposed docks for the city, two on the north side and one at the Windmillcroft, now Kingston Dock, opened in 1867; but as late as 1807 we read of crowds coming to the Broomielaw to see a brig of 100 tons—not a common gabbart, but a real vessel with two masts and yards!

The year 1812 saw the first trips of the steamship *Comet* from Glasgow to Helensburgh and Gourock, and seven years later the *Vulcan* was built at Faskine on the Monkland Canal, one of the first iron vessels. A traveller writing in the Waterloo year mentions that he sailed in the *Comet* from Glasgow to Greenock, and arrived after a seven hours' passage, three hours of which, however, had been spent on the sandbank at Erskine. At Greenock he boarded another vessel and arrived in Rothesay on the same day as he left Glasgow, a feat which had never been performed before. Now, by train and steamer combined, Rothesay is only an hour and a half from the city.

The great improvement which had been made on the river was shown in 1828, when for the first time a ship from the West Indies came right up to Glasgow with a cargo of

raw sugar for the refinery in Ann Street. She must have taken several tides to get up from Greenock, coming partly under sail and partly towed by horses from Renfrew. Glasgow's gain was loss to other burghs, however, and the early dredgers used for deepening the channel were known as the "Terror of Greenock." Dumbarton also suffered, but her loss as a port was more than made up by the new trade of shipbuilding, and from 1840 onwards this ancient royal burgh has progressed by leaps and bounds.

The Queen's Dock on the north side of the harbour carried out Telford's dock scheme and added thirty-three acres of water space; it was largely used by liners belonging to the Clan, City, Donaldson, and Anchor Lines. On the south side Prince's Dock was in like fashion used by the Allan Line, and is now used by the ships of the Canadian Pacific, the Anchor-Donaldson, Furness-Withy, Maclay and McIntyre, and other companies. Large as these new berths were, steamers grew larger still, and accordingly the Clyde Trustees not only added the Rothesay Dock at Yoker, but are at the present time completing a great series of seven docks from Shieldhall to Renfrew. Rothesay Dock, with its mile of wharfage, is intended chiefly for handling coal and ore, and special provision is made for grain at Meadowside and for live cattle at Merklands, while the most recent form of specialization is seen in the provision of huge storage tanks for oil near Bowling, so that vessels using that fuel—nicknamed "oilers"—may fill up their reservoirs in bulk. As the Clyde does a large trade in ship-repairing as well as ship-building, graving docks are necessary; three of these belong to the Trustees, and two others to private firms.

The jetties of Golborne increased the depth of the river to 14 feet at Dumbuck, and by blasting Elderslie Rock the depth was increased to 28 feet below low-water mark, and now the whole channel from Glasgow to Port-Glasgow has been made a canal, 35 feet deep at high water, marked by perches during the day and by gas buoys at night. The result is that steamers of the largest size can come from

Greenock to Glasgow in one tide, and it is a common thing for ships to leave the port with 12,000 tons on board. In 1800 the total berthing space at the Broomielaw was only 382 yards, and the revenue of the port £3,319; in 1920 the wharfage had extended to 11 miles and the revenue to over a million pounds, while the docks now under construction at Shieldhall will add another 5½ miles of quays.

The whole management of the harbour is vested in the Clyde Trustees, whose jurisdiction extends from Carmyle Weir above the city to a line drawn from Newark Castle, Port-Glasgow, to Cardross Castle in Dumbartonshire. These Trustees, now 42 in number, are an elected and representative body, and comprise 18 members chosen by the shippers and others using the harbour, and 24 chosen by the councils of the towns and counties bordering on the river, the City of Glasgow having 11 members.

Records of Progress

A community cannot attain manufacturing greatness unless it has facilities for exchange, for importing raw materials and for exporting manufactured goods. It might, therefore, be expected that the growth of the harbour would reflect the general advance in prosperity of the city, both as to wealth and population, and such is really the case. In this respect the tax-roll of the Royal Burghs forms a very useful index to the relative rise or fall of the leading Scottish towns, and it is interesting to see how Glasgow especially has been rising steadily century after century. In 1556, in the reign of Queen Mary, Glasgow was only the eleventh town in Scotland for taxable value, although admittedly the foremost for beauty. Edinburgh that year was rated at £2,650, Dundee £1,265, Aberdeen £945, Perth £742, St. Andrews £300, Montrose £270, Ayr £236, Glasgow £202, Haddington £147. A hundred years later (1649) Glasgow had a tax value of £1,170, Irvine £180, Dumbarton £108, Rothesay £54, and Rutherglen £36. In 1660, at the Restoration, the population of the city

was 14,678, nearly double that of fifty years before, and at the visit of Jouvin de Rocheford the following year Glasgow was the second city in Scotland. The troublous times of Charles II. and James II. affected the west of Scotland very badly, and at the Revolution of 1688 the population had actually fallen to 11,948, the only drop in its history.

With more settled government recovery followed rapidly, and in 1692 the tax-roll shows the following sums per £100 : Edinburgh £32, 6*s.* 8*d.*, Glasgow £15, Aberdeen £6, 1*s.*, Dundee £4, 13*s.* 4*d.*, Perth £3, Stirling £1, 8*s.* 8*d.*, Linlithgow £1, 6*s.*, while the smaller Clyde burghs make a poor show—Irvine 10*s.*, Renfrew 6*s.*, Rothesay and Dumbarton 5*s.* each, and Rutherglen 2*s.*

The figures for 1695 show Glasgow again in the second place, her increase being due to herring, sugar, and soap. As already mentioned this last was a by-product of the whale fishery, and the city at that time possessed the only soap-work in Scotland. Port-Glasgow was at that date the leading port on the Clyde, Glasgow and Greenock being sub-ports till 1812.

The figures for 1708 show a population of 12,766, a rise of only 818 since 1688, but in the next four years it had risen to 13,832, and the tax-roll shows a long lead over the other Clyde burghs, the figures being, out of £98, Edinburgh £40, Glasgow £16, 14*s.*, Irvine 12*s.*, Dumbarton and Renfrew 6*s.* each, Rutherglen 5*s.*, and Rothesay 4*s.*

In 1726, the year of Defoe's visit, Edinburgh was rated at 36 per cent., Glasgow at 18½ ; two years later the figures were 34½ and 19½. By 1755 Glasgow had 23,546 inhabitants, Paisley came next with 4,600, then Irvine 4,025, Greenock 3,800, Dumbarton 1,480, Rutherglen 988, and Renfrew 680.

From this point onwards Glasgow advanced at an increasing rate, following on the development first of the tobacco and then of the cotton trade, while Paisley specialized in weaving to begin with and later in cotton thread, and Greenock became the Scottish centre of sugar-refining. The smaller burghs practically remained stationary or even went back until

within our own days, when engineering and shipbuilding put Dumbarton on its feet again, chemical works did much the same for Rutherglen, whose only ships are now on the arms of the town, and shipbuilding, engineering, and harbour works are now making Renfrew lift its head, although the ancient burgh of the Stuarts is not yet included in the first sixteen towns of Scotland. The census of 1921 showed Glasgow to have a population of 1,034,174, but by natural increase and a further extension of its boundaries the estimated population in 1926 was 1,113,482. The same census gave the population of Paisley as 86,000, Greenock 81,600, Motherwell and Wishaw (now united) 71,700, Clydebank 47,200, Coatbridge 44,800, Hamilton 40,300, Kilmarnock 36,500, Ayr 36,100, Falkirk 34,500, all in the industrial area, the sixteenth being Perth with 32,200, and showing a decrease, though it was formerly the seventh city in the country. In short, with the exception of Edinburgh, Dundee, and Aberdeen, which rank as second, third, and fourth in the list, and Dunfermline and Kirkcaldy, which are tenth and eleventh, the first sixteen towns of Scotland, as already mentioned, are all in the great industrial area from Falkirk to Ayr, of which Glasgow is the centre.

Yet a hundred and seventy years ago Glasgow had only ten streets, and was surrounded by cornfields, kitchen and flower gardens, and beautiful orchards abounding with fruits of all sorts. It was indeed famous for its apples and small fruit grown to the end of the eighteenth century, and its greatest orchard was in what is now the Gorbals—about the last place where one would look for "rare and refreshing fruits." It is possible sometimes to pay too high a price for civilization and progress.

Chapter XII

ROADS, RAILWAYS, AND CANALS

Changes in Locomotion

THERE are three things, says Francis Bacon, which make a nation great and prosperous: a fertile soil, busy workshops, and easy conveyance for men and commodities from one place to another. Last century the popular symbol of progress was the picture of an inclined plane, up which mankind was slowly but surely moving to better and higher things. This theory, however flattering to us who are the heirs of all the ages, is contradicted alike by history and experience, as the study of our local history has already shown; and it has now been realized that progress does not follow an even gradient but is made by steps, and that these steps are not always upward; and further, that successive advances are due, not to mankind as a whole, but to the rise of individual geniuses, specially gifted along special lines. This is well seen in the history of locomotion and transport.

Primitive man was content to walk or run on his own two feet until some unnamed genius caught and tamed a horse, and some other genius, equally unknown, invented wheels. Then for at least six thousand years, from the days of ancient Babylon and Egypt down to 1814, the maximum speed of travel was that of a galloping horse, and no advance on this was made in all these sixty centuries. Then came the steam engine of James Watt and its application to locomotives by George Stephenson; in 1825 the first railway train ran between Stockton and Darlington, and then within a few years men and goods were travelling at the rate of a mile a minute. Another steam engine, placed on the *Charlotte Dundas* in

THE "CHARLOTTE DUNDAS."

1802, rendered navigators independent of wind and tide, and led in our time to the crossing of the Atlantic in five days. More recently the discovery of petrol and the invention of the internal-combustion engine have brought into our world two new agencies of locomotion which are still in their infancy, the motor-car and the aeroplane. Motor transport is already seriously threatening the railways, and motor buses are cutting out electric tramways. Almost any motor-car can take the road at thirty miles an hour, and most of them can do much more, while aeroplanes can fly more than 200 miles an hour and rival the swallows in their continental range. Roads have again become "the nerves and sinews of the land," and a new tourist traffic has been created which is independent of cuttings and tunnels, free to follow old historic routes and waken up ancient inns from their century sleep. Fresh suburbs have been flung out from our cities along the main highways, new towns are springing up out of sleepy villages,

and people are discovering again the combination of geography and history which forms the fascination of " Bonnie Scotland."

Early Roads and Bridges

The Romans taught us how to make roads and build bridges, but the lesson was badly learned, and for nearly a thousand years after their departure Scotland was much worse in matters of transport than it had been in Roman times. The Middle Ages saw a fresh start made in architecture ; great cathedrals were erected, and the art of bridge-building was re-discovered. From the dawn of history the inhabitants of the Glasgow district had been obliged to cross the Clyde by fords—at Dumbuck, Glasgow, Cambuslang, and elsewhere—but in the time of Wallace, according to Blind Harry, there was a wooden bridge at Glasgow, the first bridge over the Clyde, and this was replaced in 1350 under Bishop Rae by the stone bridge with eight arches which figures so prominently in views of old Glasgow.

The roads, however, were in a deplorable condition. The original Roman roads had been allowed to fall into disrepair, and transport was carried on under conditions of the greatest difficulty and even danger. In winter time conveyance became impossible, and country districts were completely isolated. Even the towns were connected only by pack-roads; all loads were carried on horseback, slung in sacks or creels over the backs of pack-horses. Passengers also had to travel on horseback, and in 1739, when Smollett went from Glasgow to Edinburgh on his way to London, there was neither coach, cart, nor wagon on the road, and he travelled as far as Newcastle on a pack-saddle between two baskets, one of which contained his luggage. In 1755 James Watt rode from Glasgow to London, and took fourteen days to the journey. The poor walked, and by keeping off the road made the best speed ; the rich rode, and could also choose their pathway ; the owners of coaches had the worst of it, for they must keep to the roadway, where pot-holes were numerous and

in a wet summer the mud lay four feet deep. What it must have been in winter lacks description, for no sane person travelled then except from dire necessity, and when compelled to go he made his will and had prayers publicly offered for his safety. The frequent mention of a coach and six in those days conveys a false idea of luxury; the fact is that at least six horses were needed to drag the coach along at not much more than a walking pace, and often plough-horses had to be borrowed from the nearest field to extricate the conveyance from some mud-hole of extra depth.

Travel in the Eighteenth Century

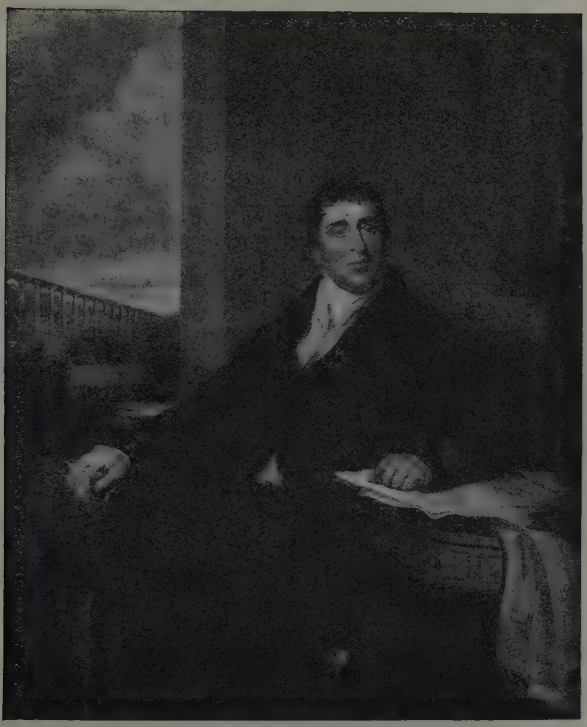
When this was the case even between the capital cities of London and Edinburgh, things were naturally much worse in the country districts. After the rebellion of 1745 Marshal Wade opened up certain districts of the Highlands by making 260 miles of roads for military purposes; but there were no roads at all north of Inverness or west of the Great Glen, nor were there any in the south-western counties. Highwaymen swarmed on the main routes, especially near London, to which all roads led, and to the north of Glasgow security from Highland raiders was only obtained by paying "blackmail" to some local chief like Rob Roy—a kind of insurance premium which was levied as near Glasgow as Campsie, and as late as 1745. There were no coaches north of the Tay in 1720, and not till 1749 did the first stage-coach run between Edinburgh and Glasgow; it started from the "Saracen's Head" in the Gallowgate twice a week, and took two days and twelve hours for the journey of forty-six miles. Ten years later it was followed by "The Fly," which took only a day and a half; this was a great improvement on former times when a coach and six took as long. The cheapest and quickest way of travelling was that adopted by Dr. Skene of Aberdeen in 1753 in coming from London to Edinburgh. He bought a mare in London for eight guineas, and at the end of his journey sold it for the same money in Edinburgh,

having spent nineteen days on the road at a total cost of four guineas and a half.

As travelling was so tiresome and expensive, travellers were naturally scarce, and Scottish inns were both dear and bad. When Boswell took Dr. Johnson to Scotland in 1773, the great man was lodged in Glasgow at the "Saracen's Head" already mentioned, the first inn in the West to offer decent accommodation. It was from this famous inn that the mail coaches started for Edinburgh, London, and elsewhere, and when in 1788 the first Royal Mail Coach arrived from London by Carlisle in ten days, a gun was fired to announce its arrival and it was welcomed by a procession of the inhabitants. Now the journey is done in eight hours.

Telford and Macadam

In 1757 Thomas Telford, the great engineer, our British "Colossus of Roads," as Southey the poet called him, was born in Eskdale. In 1802 he was asked to make a road survey of Scotland, and he found some 800 miles of roads in existence, the best being the three great military roads made or planned by Wade—from Inverness by Glenmore and Tyndrum to Loch Lomond, from Fort Augustus to Blair Athol, Dunkeld, and Perth, and from Fort George by Badenoch to Braemar. Under Telford 920 miles of roads were added in eighteen years, and in the Highlands bridges were built on the main routes at Dunkeld, Fochabers, Dingwall, and Beauly. He inspected and reported on the Caledonian Canal route in 1801, though the work was not finished till 1847, and in 1804 he did the same for the Glasgow, Paisley, and Ardrossan Canal, under the Earl of Eglinton. This canal was originally planned to connect Glasgow with the sea, but its cost proved greater than was expected, and it got no farther than Johnstone. It has now been converted into a railway, but the name of its founder persists in Port Eglinton and Eglinton Street. Telford's greatest monument in the West is the magnificent road from Glasgow to Carlisle, in which he followed closely the Roman



THOMAS TELFORD.

line and the Roman methods, laying down those principles of road-making which were afterwards associated with the name of Macadam and are still in use. He also built the Menai Suspension Bridge, the similar bridge at Conway, and the Dean Bridge over the Water of Leith in Edinburgh. The last of his bridges was Jamaica Bridge in Glasgow, finished in 1836, and 60 feet wide, at that date the widest in the kingdom. He died in 1834, and was buried in Westminster Abbey.

The labours of Telford and Macadam ushered in the palmy days of coaching, which figure so much in the pages of descriptive writers down to Dickens. With the introduction of railways in 1825 road-making again began to be neglected,

and it is only within the last forty years that our roads have again been restored and improved, first to meet the demands of cyclists, and in more recent times by the rapid growth of motor transport. At present a sum of £20,000,000, raised from motor-car licences, is being spent upon roads every year, and the result has been the formation of broad thoroughfares, or "boulevards," sometimes 100 or 120 feet wide, and giving space for six tracks for vehicles besides footpaths. Macadam's original methods of road formation have been improved by the use of tar as a binding material, and experiments are being made with other materials to give a smooth and durable surface for the increasing motor traffic.

Early Motor Traffic

The bad state of British roads generally was partly to blame for the long delay in developing motor traffic and for leaving it to France at the outset, although most of the motor pioneers were British. The first motor carriage dates from 1600, and was the invention of a Dutch mathematician, Simon Stiven. It was really a land sailing boat on wheels, driven by the wind, and it ran from Scheveningen to Petten at twenty-one miles an hour, carrying twenty-eight passengers, among whom were Prince Maurice and the Spanish admiral Mendoza, then his prisoner. A similar but smaller land-boat is mentioned in *Tristram Shandy*. Wind propulsion was tried by several inventors, but was dropped after 1760, and the only land survivals are now such pleasure craft as ice-yachts and sand-yachts, the former running on skates and the latter on wheels.

The credit for the first road locomotive must be given to France, for in 1763 Nicholas Cugnot made a three-wheeled lorry propelled by a small steam engine, which ran at a speed of two and a quarter miles an hour, carrying four persons in addition to goods. The boiler of this carriage was so small that every quarter of an hour the engine had to stop to get up steam. An improved model was made in 1770, and the

original carriage is now in the *Conservatoire des Arts et des Métiers* in Paris. The next inventors hail from Britain, and in 1784 William Murdoch, the discoverer of coal gas, made a small steam carriage which ran very successfully. He tried it one night on the road near Redruth, Cornwall, where he was working at the time, and encountered the local parson, who, seeing this fiery beast approaching at a run, took to his heels, thinking it no less than a belated dragon if not something worse. Murdoch was busy with the engine-works of Boulton and Watt, and did not follow up his invention. Symington of Leadhills made a steam carriage in 1786, but his engineering skill was mainly devoted to marine engines, as will be seen later. In 1800 Richard Trevithick made a steam carriage, and on its trial trip in 1801 this took eight people up the hill of Camborne Beacon half a mile an hour faster than a man could walk. Trevithick's engine was notable for possessing different gears to suit varying conditions of road and load, a principle now adopted in all motor vehicles. His further experiments were dropped owing to the state of the roads.

Not till 1827 was steam locomotion again attempted, this time by Gurney, whose steam coach carried fifteen passengers at twenty-one miles an hour, and four years later his steam coaches had made 400 trips between Cheltenham and Gloucester and had earned a profit for their owners. Here again progress was stopped, not in this case by bad roads but by bad laws, which imposed heavy tolls on road locomotives, and this and other services ceased after 1840.

Modern Motor Traffic

The next important step was taken by Gottlieb Daimler, a director of the Otto Gas Engine Works at Deutz, opposite Cologne. In 1884 he made a small gas engine for very high speeds, and fitting this to a bicycle in 1886, he got very satisfactory results from this first motor bicycle. In 1889 his patents were acquired by Panhard and Levasseur, and two

years later the first motor car appeared—a Panhard. Five years later so much progress had been made that a Paris newspaper, *Le Petit Journal*, organized a race from Paris to Rouen, seventy-eight miles. More than a hundred cars were entered though only twenty turned up, fourteen driven by petrol and the rest by steam. The winner was a steam car, which completed the distance at twelve miles an hour. This was followed by a longer race, from Paris to Bordeaux, 730 miles ; twenty-two cars started and nine finished, the winner, a Panhard, doing the whole run in 48 hours 48 minutes, including a five-minutes stop at Bordeaux. Pneumatic tyres were used for the first time in this race.

In 1895 two Englishmen brought over French cars to England, and gave a demonstration to members of Parliament and others at Tunbridge Wells. This was the first motor show in Britain, and consisted of two petrol cars, a steam car, and a motor bicycle ! So satisfactory was the result, however, that Parliament passed in 1896 the Light Locomotives Act, releasing motor cars from the previous restrictions, and next year the first British car was made, and a new and flourishing industry started. Every year sees more and better cars on the roads, which have been greatly improved to receive them. In the Glasgow area Telford's great trunk road to Carlisle is being widened, a new road 100 or 120 feet wide has been made from Glasgow to Edinburgh, and a third from Glasgow to Dumbarton via Duntocher, while general improvements are going on in the straightness, width, gradients, and surface of all first-class and most second-class roads. Those changes are enticing to the country many town dwellers, who find that by the help of the motor car their places of business in town are nearer in time though farther in distance. The petrol-driven car has still much to learn, however, for at present, even in the best cars, something like 85 per cent. of the energy is wasted.

The four years ending in 1929 saw an enormous development of motor-bus traffic, and with the exception of Leadhills and Wanlockhead there is not a village in the Scottish Mid-

lands which does not possess an efficient daily service. In many cases this has been at the expense of local railway and tramway systems, and this has led to the formation of working agreements between bus-owners, corporations which own tramways, and the railway companies, which last have now the powers to run buses of their own. As a result of the popularity of the motor bus many tramway lines are being lifted all over Scotland, and in the Clydesdale district the only tramways left are those of Glasgow and one section in Lanarkshire.

In addition to very full local services, the buses provide many long-distance journeys, and run regularly from Glasgow to Inverness by Pitlochry; to Aberdeen by Perth, Dundee, and the east coast; to Oban by the Gareloch, Loch Long, and Loch Lomond; to Ardrishaig and Campbeltown over the famous pass, "Rest and be Thankful"; to Edinburgh direct, and also by Motherwell; to Newcastle by Edinburgh, by Galashiels, and by Carlisle and Hexham; to Liverpool by Kilmarnock; to Manchester by the Clydesdale route; and even to London. There is, in addition, a very full "tourist" service to favourite beauty spots such as the Trossachs, the Clyde Lochs, Peebles and Melrose, St. Mary's Loch, and the Burns country.

As many of these trips open up parts of the country which have no railway connection, they have given the passengers an opportunity of making new discoveries of Scotland and of establishing personal relations with what were formerly mere historic names.

Railways

Coming next to consider our railways, we have to remember that the steam carriage really began as a road vehicle. It was found, however, to be much more successful on rails, and in 1814 George Stephenson made his first locomotive engine for drawing coal wagons at Killingworth Colliery, near Newcastle. In 1825 the first railway was opened between Stockton and Darlington, and as we pass the latter station

OPENING OF THE GLASGOW AND GARNKIRK RAILWAY IN 1831.

we may still see on the platform the engine "No. 1," the pioneer of the world's locomotives. Stephenson's "Rocket," now in South Kensington Museum, made its first run on the Liverpool and Manchester line on January 1, 1830, and from that date railways spread like an epidemic, which reached its height in the great railway mania of 1845.

The first Scottish railway, really a tramway, ran from Kilmarnock to Troon, 9½ miles, and was opened in 1810. It ran on cast-iron rails fastened to stone blocks, and was built for carrying coal, but passenger trips from Kilmarnock to the coast were greatly in favour. The next railways in Scotland were one from Monkland to Kirkintilloch, opened in 1828, and two years later a small line at Ballochney, Airdrie, both of which were later absorbed by the North British Railway. The fourth railway, from Glasgow to Garnkirk, was opened in 1831, and the same year saw the "innocent" railway in use between Edinburgh and Dalkeith, on which horse traction was used for the passenger coaches. In the year 1845 the Caledonian Railway Act was passed, which authorized the formation of the line from Carlisle to Carstairs, branching thence to Edinburgh and Glasgow.

The Glasgow and South-Western line was founded in 1850, and the North British in 1844; the Great North of Scotland Act was passed in 1846, and the Highland Railway Act in 1856. In 1923 all these Scottish lines were absorbed by two great trunk companies; the London, Midland, and Scottish combines the former Caledonian, the Glasgow and South-Western, and the Highland railways, and the London and North-Eastern operates the former North British and the Great North of Scotland railways. Sixteen trains equipped with restaurant cars or sleeping-carriages leave Glasgow every day for London, doing the journey in eight hours, and nearly forty trains leave for Edinburgh, the expresses taking sixty-five minutes. The next step will be the use of electricity for local traffic, especially in the populous suburban districts of Glasgow and Edinburgh, and the linking up of branch lines with motor-bus services, a process which is being rapidly developed.

Tramways

Another method of road conveyance is of comparatively recent origin, namely, tramways. Glasgow opened its first tramway line in 1872, with horse traction, and under a private company. The Corporation took over the system in 1894, and introduced electric haulage four years later. Now the city possesses 275 miles of single track, which compares favourably with London's 331 miles, Manchester's 226, Birmingham's 145, and Liverpool's 167. Over nine million passengers a week are carried, and the system now extends from Airdrie and Uddingston in the east, to Kilbarchan and Dalmuir in the west, and from Bishopbriggs on the north to Barrhead in the south, while extensions are still in progress. At Dalmuir the Glasgow cars connect with the Dumbartonshire lines, giving a through route to Dumbarton and Balloch, and at Uddingston with the Lanarkshire lines, connecting with Bellshill and Holytown, Motherwell and Wishaw, Cambusnethan, Newmains and Larkhall. Glasgow Corporation has on the road no fewer than 1,135 tramcars and 241 buses, and this service employs nearly 9,000 workers.

Canals

Unlike Holland or even England, Scotland does not lend itself to the construction of canals, and there are now only three in the whole country. The first canal in Britain was the Bridgewater Canal made by Brindley in 1761, and the next twenty years saw the Scottish canals in being. The largest of these, the Caledonian Canal, over sixty miles long, was surveyed by James Watt in 1773, but was actually begun by Telford and Jessop thirty years later. It is really a series of short canals connecting Lochs Ness, Oich, and Lochy in the Great Glen, and allows boats less than 170 feet in length to avoid the Pentland Firth by taking this short cut between Inverness and Fort William. The little Crinan Canal, nine miles long, from Ardrishaig to Crinan, serves a similar pur-

pose in providing a short cut from Loch Fyne to the west coast, and avoiding the stormy passage round the Mull of Kintyre. Since 1818 both of these canals have been under one management, and are in regular use for tourist traffic. The Paisley Canal was originally planned to extend to Ardrossan, but got no farther than Johnstone. Starting from Port Eglinton in Glasgow, it carried in its best days 300,000 passengers a year, besides goods ; but railway and road competition drew away its traffic, and in 1883 it was bought by the Glasgow and South-Western Railway Company and converted into the railway line still known as the Canal line.

The oldest canal in Scotland is the Monkland Canal, passing through the parishes of Old and New Monkland, to the east of Glasgow. It was projected in 1769 for the supply of coal to Glasgow, and was surveyed by James Watt. Starting from Port Dundas in the north of the city it runs east on the level for two miles to the foot of Blackhill, and then other eight miles, ninety-six feet higher, to its terminus at the North Calder near Airdrie. The sharp rise at Blackhill is overcome not merely by a double set of locks, but by an inclined railway, over which the barges are hauled by steam power. Since 1867 the Monkland Canal, like the Forth and Clyde Canal, has belonged to the Caledonian Railway Company, now merged in the London, Midland, and Scottish.

The Forth and Clyde Canal

The remaining canal is one of considerable value, and may rise in the future to the dignity of a national waterway. This is the Forth and Clyde Canal, nearly thirty-nine miles long, from Grangemouth on the Forth to Bowling on the Clyde. It is connected with the Monkland Canal at Maryhill, and at Falkirk sends off to Edinburgh a branch called the Union Canal. It was begun in 1768 under the engineer Smeaton, and was opened from sea to sea in 1790, and to meet the cost of its construction the Government voted a grant of £50,000 from the Jacobite estates forfeited after Culloden.

The First Steamships

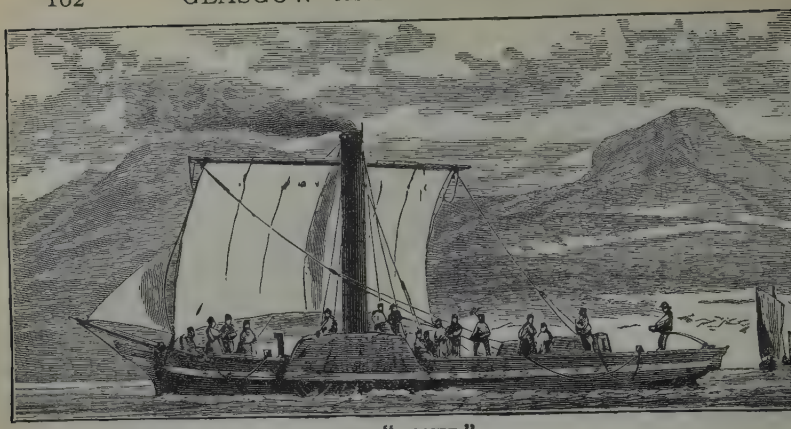
Apart from its use as a short cut from the east to the west of Britain, this canal is interesting as being the birthplace of steam navigation. In 1787 Patrick Miller of Dalswinton in Dumfriesshire had made a little paddle-boat worked by men; but William Symington, an engineer born at Leadhills, suggested the use of steam, and between them they constructed a small steamer by way of experiment. The following year this little craft made its trial trip on Dalswinton Loch at five miles an hour—Robert Burns being one of the passengers. Encouraged by the success of this, they built a second steam vessel of thirty tons at the Carron ironworks, and launched it on the Forth and Clyde Canal in November 1789. This boat travelled at seven miles an hour, and ten years later Symington was asked by Lord Dundas to make a steam tug for the goods traffic. This was the famous *Charlotte Dundas*, a stern-wheeler, which began work in 1802, and succeeded in towing two barges of seventy tons each a distance of nineteen and a half miles. This pioneer steamer was a distinct success, but fears were entertained that the wash from her paddle-wheel would injure the canal banks, and so her official life was short. The *Charlotte Dundas*, however, had been seen at work by Fulton and Henry Bell, and in 1807 the former placed on the Hudson River at New York his *Clermont*, engined by Boulton and Watt, and in 1811 Bell produced his *Comet*, the first steamboat on the Clyde—daughters both of the original *Charlotte Dundas*. Symington's monument stands outside Leadhills churchyard, and that of Henry Bell forms a prominent object in the upper Firth at Dunglass, near Bowling.

A Ship Canal

The scheme has again and again been advanced of making a first-class ship canal from the Forth to the Clyde, suitable for ships of the largest size, and three alternative proposals have been put before the public. One is to run a canal up

HENRY BELL MEMORIAL, DUNGLASS.

(Photo: The Bulletin.)



THE "COMET."

the Forth valley west from Stirling, through the level country occupied by Flanders Moss, and then to cross over by Drymen into Loch Lomond. From this there is a choice of exits —either by a cut from Tarbet to Arrochar and so into Loch Long, or by canalizing the river Leven and entering the Clyde at Dumbarton. In opposition to these Loch Lomond routes Glasgow opinion favours a direct canal from Grangemouth to Bowling almost on the lines of the present one, but wider and deeper, and with fewer locks. This line has the advantage of passing through a busy industrial district, now almost a continuous town, of serving a huge population, and of bringing the shipbuilding yards of the Clyde into direct touch with the east coast trade routes. It would put Glasgow into direct touch with the great continental ports of Hamburg, Rotterdam, and Antwerp, and save the stormy passage by the north of Scotland through the Pentland Firth, or the longer route round the south of England. At the same time the cost of construction would be much increased by the density of population in this district, and the consequent number of land routes which would be crossed by the line of the canal.

So much did the Glasgow merchants realize the importance of such a waterway that it was they who first approached

Parliament for powers to make the Forth and Clyde Canal, and they backed their opinion by subscribing the whole of the capital in two days, as the result of Smeaton's survey, and no doubt the Clyde towns would be prepared to take large shares in the proposed ship canal. The Great War, moreover, showed how useful to the nation such a work might have been, by enabling warships to be transferred rapidly from west to east, and by giving opportunities for ships disabled in action in the North Sea to be sent to the Clyde yards for repair; and so a very good case seemed to be made out for a government subsidy to aid in its construction, as was granted in the case of the present Forth and Clyde Canal.

Chapter XIII

MANY INVENTIONS

The Darien Scheme

THE Union of 1707 brought to Glasgow and the west of Scotland opportunities which the people were quick to grasp, and yet nowhere in Scotland was the Union more unpopular. In the city the Provost had to hide in order to save his life, and riots broke out which at one stage threatened to become an insurrection. That distrust of England which found expression in the Act of Security (1703), practically annulling the union of the crowns, had been intensified by the failure of the Darien expedition, in which Scotland in general, and Glasgow in particular, suffered grave losses.

William Paterson, founder of the Bank of England, devised a scheme for a " Company of Scotland trading to Africa and the Indies," and Scotland subscribed one-half of her national wealth in the adventure, Glasgow Corporation contributing £4,000 in addition to the individual shares taken by the citizens. The company was originally intended to be a rival to the English East India Company, and incurred the bitter opposition of that and of the similar Dutch corporation. Paterson then transferred the scene of the Scottish operations to Panama, and some of the ships were fitted out at Greenock. The failure of the colony is a matter of general history ; the colonists had to struggle against the passive opposition of the English and the Dutch and the active opposition of Spain, against ignorance and mismanagement, and, worst of all, against the mosquito, the carrier of malarial diseases. Yet Paterson was a long-sighted man, and his scheme a sound one,

as the experience of our own day has shown. It only needs a glance at the map to realize the key position of Panama; but the conquest of the mosquito at the beginning of the present century was needed to make possible the Panama Canal, through which now passes a volume of shipping traffic exceeding that of the Suez route.

Effects of the Union

With the Union, however, came free trade with England, and the removal of the handicap to Scottish shipping caused by the Navigation Act, and almost at once Glasgow and the Clyde ports jumped into newness of life in connection with American trade. The next two centuries have been divided into four periods of trade development, during which the growth of these ports, and of Glasgow in particular, rivalled that of the mushroom cities of America. The first was the Tobacco Period, from about 1707 to 1768, during which the population rose from 12,000 to 26,000; the next fifty years, from 1768 to 1821, was the Textile Period, when it increased fivefold; during the next period, between 1821 and 1861, characterized by Textiles and Iron, it trebled itself; and in the fourth period, the present age of Steel, represented by shipbuilding and engineering, it again trebled itself. Between 1751 and 1831, in the span of a single lifetime, the population of Glasgow increased tenfold, and the other towns of the district shared in the advance. Dr. Hill Burton says, "Glasgow was the only place where there was the same kind of visible progress in the early half of the (seventeenth) century as the rest of the country developed in the latter half." The Union revived the shipping trade, which had been paralysed by the Navigation Act, but it was not until 1716 that the first "honest" vessel in the West India trade crossed the Atlantic from the western capital. In 1735 Glasgow possessed sixty-seven vessels; of these forty-seven traded to foreign parts, the greater number of them crossing the Atlantic, and although these figures seem small they constituted nearly one-half of

all Scotland's shipping, which was at that time only one-fortieth that of England.

The Tobacco Period

Mention is often made of the " four young men who made Glasgow." They were John Glassford of Dugaldston, Archibald Spiers of Elderslie, William Cunningham of Lainshaws, and James Ritchie of Busby, and by their enterprise and energy they not only wrested from England the lion's share of the American trade but a large share of the continental trade as well. John Glassford went into the tobacco trade, became the owner of a fleet of twenty-five ships and their cargoes, and turned over half a million a year, equal in real value to ten times that sum to-day. His town house, the Shawfield Mansion, was occupied by Prince Charlie, and its site is now occupied by Glassford Street. Spiers of Elderslie founded a county family which is still to the fore, although the estate has now been acquired by the Clyde Trustees, and is being formed into docks. These were the first of the " Tobacco Lords," who cut such a prominent figure on the Plainstanes of the Trongait ; the name of Virginia Street recalls the source of their wealth, and such a hold had they on the trade that in 1772, just before the American War of Independence, out of 90,000 hogsheads of tobacco imported into all Europe, Glasgow accounted for 49,000, most of which was re-exported to France. It is said that the first Glasgow ship in the trade was a vessel of 60 tons, built at Crawford's Dyke in 1716, whose captain acted as supercargo. On his return the city merchants asked him for his statement of accounts, and his reply took the form of a seaman's bag or " hogger " bursting with coin. Tobacco ruled everything for sixty years ; the ship's burden was reckoned not in tons, but in hogsheads, and as the cultivators on the other side were paid in goods a great stimulus was given to manufactures for export, particularly of such articles as were necessary to colonists in a half-settled country. The Scottish traders had a market ready-made in

Virginia and the southern States, for thousands of Covenanters had been shipped across the Atlantic, and although most of these had succumbed to the climate and ill-usage, many had survived and done well, and maintained a lively interest in their native Clydesdale. The American War of Independence put a sudden end to the original form of the tobacco trade. It still continues, but has changed its character, and from being the greatest European distributing centre of tobacco as a raw material, Glasgow has now become the leading centre of its manufacture. In 1913 the quantity of raw tobacco imported into Glasgow was stated as four and a half million pounds, and the output of the manufactured article was valued at about £1,000,000 per annum.

Sugar Refining

The closing of the United States to British traders led to the diversion of their American shipping to the West Indies —hence the name Jamaica Street—and raw sugar became the leading import, its refining being carried on in Glasgow and Greenock. The latter town, indeed, was known as "Sugaropolis," and before the recent revival of ship-building, it suffered the fate of those communities which put all their eggs into one basket. At the end of the nineteenth century the creation of sugar bounties by the Continental powers, especially Austria, Germany, and France, and the consequent extension of the beet sugar industry, nearly ruined Greenock. The Great War, by stopping the imports of beet sugar from European ports, revived the sugar trade of the West Indies and other parts of the Empire, and put this Greenock industry on its feet again, and at the present day all the sugar-refining in the British Isles is done in London, Liverpool, and Greenock, the last centre refining fully one-fifth of the total, while Glasgow makes sugar machinery for the whole world.

The Textile Period

The second or Textile Period, covering the last quarter of the eighteenth century and the first quarter of the nineteenth, was marked not only by the phenomenal growth of Glasgow but by the rapid rise of an extraordinary variety of industries in the whole district. In 1780 Monteith set up a web of pure cotton, the first ever woven in Scotland, and in 1783 the famous David Dale founded the mills at New Lanark, of which we shall have more to say. In 1783 Shettleston, of Calton, invented the flying shuttle; in 1772 Kelly, of New Lanark, introduced the spinning-jenny into Scotland; and next year the first power-loom was at work in Glasgow. A few years later Finlay and Co. set up works at Catrine, Deanston, and Ballindalloch, employing 2,500 workers in spinning, weaving, and finishing cotton. The Calico Printing Trade was founded in 1770; Dale and Mackintosh in 1783 set up at Barrowfield the first turkey-red dye-work in Britain; and in 1796 another Mackintosh founded Hurlet, the first alum-work in Scotland, besides creating the waterproof industry. The first glass manufactory in Scotland was opened at "Verreville" in Glasgow, in 1777, and in the same year George Mackintosh, Dale's partner, opened in Ark Lane a "secret work" for making cudbear dyes. For fifty years after 1725 flax-spinning was the staple industry in the west, and such place-names as Linthouse, Lintfield, and Linwood, show that flax was grown here as well as manufactured. In 1780 the Barony parish of Glasgow alone had three thousand looms working in linen, but ten years later cotton had superseded flax, and the weavers were making muslin. The street names of Paisley at this period reflect the industry of that town; Gauze Street, Silk Street, Lawn Street, Weaver Street, Shuttle Street, Muslin Street, Cotton Street, all date from this era, and Paisley's monopoly of the thread business began with 1725. The steam-engine was introduced into Springfield cotton-mill in 1792, and Arkwright, "the subterranean barber," entered into partnership with David Dale, bringing his new inventions,

so that by 1840 it seemed not unlikely that Clydesdale and not Lancashire would be the centre of the cotton trade.

The Iron Period

Watt's improvements made the steam-engine practicable in 1766, and the steam-engine made modern Glasgow. Iron-founding had been practised in the Highlands for a century—the first monument to Nelson was raised by the iron-workers of Bonawe, on Loch Etive—but in 1760 the Carron Company began to work the native ironstone near Falkirk, and connected their works with the Lanarkshire coal-fields by the Monkland Canal; and with the discovery of the rich mussel-band ironstone by Mushet, and the use of the hot blast by Neilson at the Clyde Iron Works in 1829, the prosperity of the Lanarkshire iron centres, notably Coatbridge and Motherwell, went up by leaps and bounds. Lastly, with the *Charlotte Dundas* of Symington in 1802, and the *Comet* of Henry Bell in 1811, Glasgow and the Clyde took at once the position which they still hold as the foremost shipbuilding centre in the world. James Watt, Henry Bell, and the two Napiers, David and Robert, were the creators of this great industry.

Variety of Industries

A recent writer sums up the position to-day: "Nowhere has man, utilizing the resources and overcoming the disadvantages of nature, built up an economic apparatus so vast and varied as that presented by Glasgow and its satellites up and down the Clyde on both banks of that half-artificial river—Motherwell, Hamilton, Rutherglen, Govan, Partick, Scotstoun, Paisley, Dalmuir, Renfrew, Johnstone, Dumbarton, Port-Glasgow, and Greenock. There is nothing in any other country like this chain of towns devoted to trade and industry, and producing all sorts of things, from the largest ships to art muslins and scientific instruments; its importance in peace and war cannot be over-stated." It is this variety of in-

dustries which has saved the district again and again in times of severe commercial depression ; even engineering is spread over many departments, such as locomotives, railway carriages and wagons, bridges, machinery, marine engines, motor cars and lorries, constructional work in architecture, and special modern developments in house-building. In the same way the chemical industry is spread over alkali and acid works, soap-making, bleaching-powder, chrome works, disinfectants, and dye-stuffs, with branches into such side-lines as cement, pottery, and glass. The same variety is shown in the shipping returns, and the Clyde Trustees recognize seven hundred kinds of goods handled at the harbour. The imports naturally fall into two main classes, food and raw materials, while the exports take the form of manufactured goods, chiefly metal wares, cotton, machinery, ships, and spirits, along with coal and coke. The annexed table shows the overseas trade of Glasgow in 1913, the year before the war, reaching a total of £54,000,000, and the corresponding figures for 1928, with a total of £87,000,000.

Imports.	Value in Thousands.		Exports.	Value in Thousands.	
	1913.	1928.		1913.	1928.
Total Imports	£18,485	£29.632	Total Exports	£35,917	£57,498
Chief Imports—			Chief Exports—		
Grain	5,198	5,314	Coal, coke, etc.	1,367	678
Cotton, raw	34	42	Chemicals	826	1,310
Fruit	739	2,576	Cotton, manufactured	5,236	7,750
Machinery	364	888	Jute	946	1
Iron ore	1,078	464	Machinery	5,016	7·475
Tobacco	159	285	Linen	2,786	1,929
Timber	1,099	1,978	Metal goods	6,157	9,680
			Oil	491	117
			Paper	568	1,255
			Ships and boats	2,834	8,659
			Spirits	2,598	5,972

A comparison of these figures for 1913 and 1928 shows very clearly the rapid recovery since the Great War, from £54,000,000 to £87,000,000, and also the falling-off in the production of iron and in the export of coal, owing to political changes abroad and economic strife at home. The collapse in jute is due to the virtual closing of the Russian market.

The export of jute and spirits is chiefly a transit trade; practically all the jute is manufactured in Dundee, and most of the spirits are distilled in Campbeltown, Islay, and other districts outside the Glasgow area. The linen trade is now centred at Dunfermline, but Glasgow still retains its lead in carpet-making, while Kilbowie is practically a "Singer" town, devoted to the production of sewing-machines. The drawback of local specialization is that when dull trade arrives in its one industry, the town in question suffers great distress, whereas, when a community like Glasgow spreads itself over many fields of work, only a fraction suffers, and help from the rest is easily got. Further, the Great War showed how easy it was for workshops to change over on short notice to war work, and we have seen the reverse process going on with almost equal ease.

Christian Shaw

To the Textile Period belong two remarkable careers, those of Christian Shaw and David Dale. The story of the former is a curious blend of mediævalism at its worst and modernism at its best, and it is of interest to us in our present study as explaining the foundation of the cotton thread industry, of which Paisley is the recognized world-centre. The records of Paisley Presbytery, under date December 30, 1696, contain the following remarkable entry: "Mr. Turner (the minister of Erskine) represented the deplorable case of Christene Shaw, daughter of the Laird of Bargarran, in the parish of Erskine, who since the beginning of September last, hath been under a sore and unnatural-like distemper, frequently seized with strange fits, sometimes blind, sometimes deaf and dumb, the several parts of her body violently extended, and at other times violently contracted, and ordinarily much tormented in various parts of her body, which is attended with an unaccountable palpitation in those parts that are pained . . . during the fore-mentioned fits, and in the intervals of them is in perfect health," and so on. To-day this would be

recognized as a case of hysteria, which might be cured by more or less simple treatment; but in 1696 there was only one cause thought of—demon-possession, induced by witchcraft. The Presbytery of Paisley found the case too hard for them, and the Privy Council took it up, sending down Commissioners from Edinburgh. Several persons, mostly women, were tried for witchcraft, seven of whom were found guilty by the jury, three men and four women, and were at once condemned to the flames. One of the men died in prison at Renfrew, probably by his own hand, but the rest of the unhappy wretches were duly burned at the stake on the Gallow Green.

Years passed, and the hysterical girl became the wife of the minister of Kilmaurs, a Mr. Millar. On the death of her husband she returned to her mother at Bargarran, and there began to display remarkable dexterity in spinning fine yarn and making it into thread. She did all the work herself, bleaching the materials on a slate at the windows, and the superior quality of her work found for it a wide market. Her mother and sisters helped in the manufacture and sale of the thread, and Lady Blantyre took a quantity to Bath and sold it to lace manufacturers. About 1725 a relative happened to be in Holland, and there learned the secret of making fine thread, as well as the construction of twisting machines and of turning machines for reels. This information he passed on to Mrs. Millar, and she quickly turned it to good account, taking in young women as learners, and setting up modern machinery. The business rapidly grew, imitators appeared as usual, and to protect the sales the product was marketed as Bargarran thread, and the wrappers were stamped with the coat of arms of the Shaws. In the course of a year or two however, the trade secrets leaked out; other factories sprang up, and to-day Paisley, from having been the weaving town of Georgian and Victorian days has become the world-centre of the thread industry.

David Dale

The other story is that of one of the makers of Glasgow, David Dale, a man far in advance of his time in his social and philanthropic aims, besides being a merchant prince of uncommon foresight and energy. His house still stands at the corner of Charlotte Street and Glasgow Green, and there is a Dale Street in Bridgeton and another in Tradeston, but these are poor monuments to a man of his outstanding personality. Originally a herd laddie at Stewarton, and afterwards a weaver at Paisley, Hamilton, and Cambuslang, he came to Glasgow as a young man and became a dealer in linen yarn, tramping the country and buying in small quantities from the farmers' wives. From this he proceeded to import linen yarn from Holland, and at the same time we find him a manufacturer of inkle, or tape, and also of printing cloth. He was also a partner in the Blantyre mills where Livingstone worked, driven by the Clyde, and in the mills at Catrine, famous for having the biggest water-wheel in Scotland. Along with Richard Arkwright he founded the works at New Lanark in 1783, which employed 1,334 hands, and were the largest cotton mills in Great Britain.

He was thus the father of the cotton trade in Scotland, and his activities were not confined to Strathclyde, for he was a partner in Spinningdale, on the Dornoch Firth, and also built a cotton mill near Oban. Further, he tried coal-mining in Barrowfield and lost money by it; he founded at Barrowfield the first turkey-red work in Britain, as already mentioned, and he opened in Glasgow a branch of the Royal Bank, the first permanent bank establishment in the city. He was one of the first directors of the Chamber of Commerce, and was a town councillor and twice a magistrate—a busy man. But the main business of his life was philanthropy and religion: as he said himself: "I gave my money to God in handfuls, and He gave it back to me in shovelfuls." The works at Dornoch and Oban were opened expressly to give work to the starving Highlanders, and at

New Lanark, a full century ahead of his time, he set himself to provide his workers with good houses, good sanitation, and good education, intellectual, moral, and religious. He was a warm supporter of missions, visited the prisoners in Bridewell, and finally acted as pastor to a small congregation of dissenters for thirty-seven years, learning both Greek and Hebrew in order the better to fulfil his ministry. For half a century it is impossible to look into Glasgow history—mercantile, manufacturing, financial, municipal, benevolent, or religious—without coming on David Dale at every turn. When he died on March 17, 1806, the whole city mourned, and gentle and semple together laid his dust to rest in the Ramshorn kirkyaird.

Robert Owen

Dale had sold the New Lanark Mills to an English company, whose manager was Robert Owen, his son-in-law. Owen was one of the many idealists who have tried to reduce socialism to practice, and he introduced a new social era among the workers. So widespread was the fame of the new departure that in one year 20,000 visitors came to see his works, among them the Czar Nicholas of Russia. The system failed, and Owen retired in 1829; but he started a new settlement on the banks of the Calder at Orbiston, near Bellshill, under the supervision of a warm disciple, Abraham Combe. Elaborate plans were drawn up for a "parallelogram" or communal building for 1,200 persons, at a cost of £96,000, but scarcely a fourth of it was completed, and that at a cost far exceeding the total estimate. The colonists or communists were a mixed multitude, and their attitude towards the Scottish Sunday was, to say the least, unconventional, so the settlement was dubbed "Babylon," a name which its ruins still bear. The project failed, as all such schemes have failed, and must fail, because it ignored the fundamental power of self-interest in human nature, and Owen died a poorer and a disillusioned man.

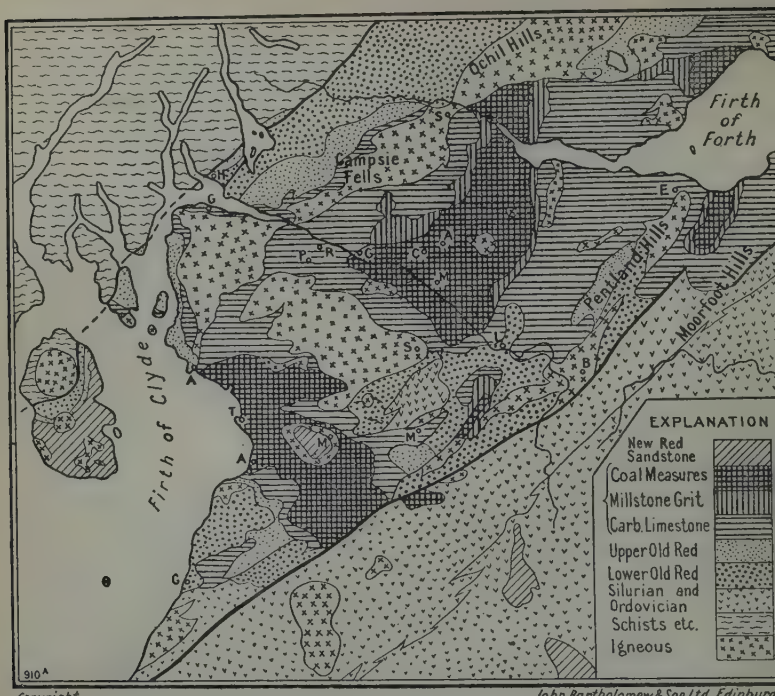
Chapter XIV

THE EARTH BENEATH

Aqueous and Igneous Rocks

THE great advance which lower Clydesdale made during the nineteenth century was in large measure due to the development of its mineral resources, especially coal and ironstone. Scotland, compared with England, is rich in building stone—red and white sandstones for walls, slates for roofing, flagstones for pavements, granite setts for streets, and whinstone for kerbs and road metal. Yet there are striking differences between one locality and another, based on their geological structure. Thus a Glasgow man, travelling to Fife for the first time, is struck by two unfamiliar things—the red tiles on the roofs and the level crossings on the railways, both of which are due to local conditions, the abundance of brick clay and the flatness of the alluvial plain.

Before examining the actual layers of rock found in the Glasgow district, it is advisable to consider the two main divisions of rocks in general, bearing in mind that the term " rock " includes not merely hard minerals such as sandstone and whinstone, but also such softer materials as shale, clay, sand, and mud. If some common garden soil be put into a jar of water, stirred round for a time and then allowed to rest, a certain settlement will take place, and always in the same order. Heavier materials such as small pebbles will first sink to the bottom, followed by smaller fragments, then by sand, and lastly by the finer particles which may take a day or more to settle, forming a fine mud on the surface of the sediment. If the water be carefully decanted, or, better still, removed by a siphon so as not to disturb the sediment,



The Rocks of the Midland Valley.

this deposit will be left as a series of layers or strata, coarse at the bottom and becoming finer in the grain towards the surface, which consists of the very fine mud. This shows us the type of all rocks which have been deposited as sediments laid down under water, and which are therefore called sedimentary rocks, or aqueous rocks (from the Latin *aqua*, water). The same order of deposit among the different materials may be seen where a river enters the sea or a burn enters a lake. The heavier pebbles are deposited almost at its mouth where the current is first checked, smaller and rounder ones are carried farther out, sand is carried still farther by the weakening stream, and lastly a fine mud may be spread out for miles,

especially in still water. The sedimentary rocks formed from these materials thus occur in sheets or layers, which are more or less horizontal to begin with, but tend to thin out and change their character as we pass from the centre of deposition to its outer edge. Thus any particular layer may begin as a pudding-stone or mass of pebbles cemented together, then pass into a coarse sandstone, then into a finer sandstone, and finally into mudstone or shale.

There are other rocks, again, which seem to have been formed, not under water, but by the action of fire, like the lava which volcanoes give out to-day. These are really old lavas, and are generally called igneous rocks (from the Latin *ignis*, fire). They may have been poured out in great sheets covering the ordinary soil, as happens to-day in volcanic eruptions, and in that case they would be covered after many years by fresh soil, or, if the land sank below the sea, by fresh sediments carried down by rivers. Or the lava may not have come to the surface at all, but been forced by sheer pressure between two layers of softer rock. Sheets of both these kinds of volcanic rocks are very common in the Midland Valley, and in both cases it is clear that the igneous rocks are nearly of the same age as the rocks which they displaced or covered. But in many cases the subterranean pressure has been so great that masses of molten rock have actually been forced *through* other layers of rock, either coming right up to the surface, and there forming rounded knob-like masses, or welling up through long straight cracks, and forming " dykes," generally of basalt. This is well seen in Galloway, where great masses of granite and felsite are found sticking up through the slaty schists of the Southern Uplands, or in such a hill as Tinto, which is a huge mass of porphyry projecting through both schists and red sandstone. These igneous rocks are generally much harder than the sedimentary rocks through which they have made their way, and are better able to resist the action of the weather, and so, where the softer rocks have been worn down by wind and rain, frost and ice, they stand out as prominent peaks and ridges. Further, the in-

trusion of a mass of molten rock at high pressure must have a very great effect on the rocks through which it passes, and the effects of both heat and pressure are seen in the changes which these rocks have undergone. Thus limestone may be half melted and changed into marble, ordinary sandstone may be changed into quartzite (the glassy " chuckie-stones " of our youth), and coal may become anthracite, or be so changed as to be useless for fuel.

The Rocks of Clydesdale: Silurian

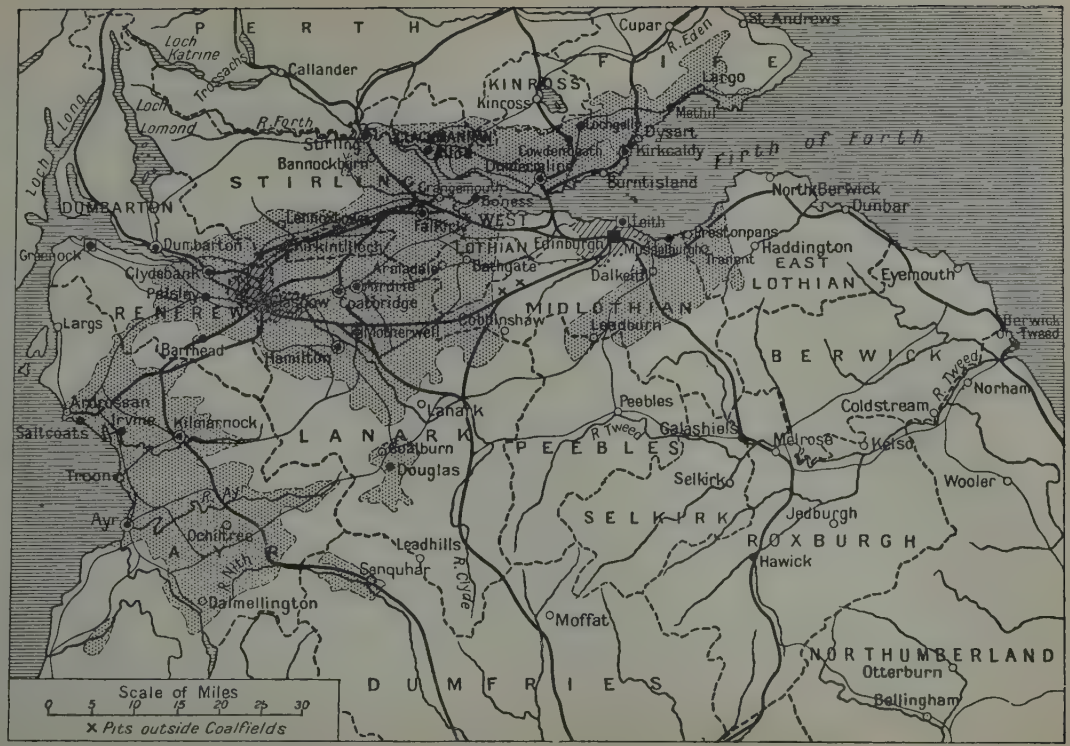
So far as the story of the rocks is concerned, Scotland is one of the oldest countries in the world, and the hills round the Minch were old and weathered long ages before the Alps were born; indeed, the youngest of the Scottish hills belongs to a remote past as compared with the Alps. The very oldest rocks in Scotland are found in the north-west of Ross and Sutherland, but the main body of the older rocks forms the Highlands of the north and centre as well as the Southern Uplands; they are often called Silurian, from the name of an ancient British tribe in South Wales where similar rocks are found. These Silurian rocks form the boundary of the Midland Valley on the north, along the line of the great crack or fault which runs from Aberdeen to Gourock, and on the south along the parallel line from Dunbar to Girvan. They include all the hills of Upper Clydesdale, the Moffat Hills, the Lowthers, and the hills running south-west from Leadhills to the valley of the Stinchar at Ballantrae. These rocks are of no commercial importance in themselves except for their quarries of coarse slates, but they contain the valuable lodes of lead ore, known as galena, which are found at Leadhills and Wanlockhead. Along with the lead are always found small quantities of silver, and in mediæval times Scotland derived all her gold coinage—never very much—from the same region, on account of which it was named " God's Treasure-House in Scotland." Even yet, when lead-mining is slack, a miner may earn some few shillings a day by washing the gold-bearing

sands of the upper Elvan, and when a royal princess or a local celebrity is to be married, sufficient native gold is got in this way to make the wedding-ring. The Silurian rocks are mostly grey, sandy shales, dark blackish shales, micaceous shales (which are easily recognized by the sparkling mica), grey-green or red chert-stones, and pebbly grit-stones. Rothesay Pier is a convenient spot for observing the difference between the Silurian rocks and their successors, the Old Red Sandstones. To the west of the pier, on the Ardbeg shore, the rocks on the beach are all grey Silurian ; on the other side, towards Craigmore. they are red sandstone, chock-full of pebbles, and Craigmore cliff itself is a huge mass of this red sandstone conglomerate, or stone-broth.

Old Red Sandstone

The Old Red Sandstone lies above the Silurian rocks, and is largely used as a building stone. It forms two parallel bands along the lines already mentioned, and in Lanarkshire and Dumfriesshire shows a thickness of 15,000 feet, or nearly three miles. The Clyde cuts through it at the Falls, and it reappears in the Firth at Wemyss Bay and forms the famous Corrie sandstone in Arran. In its lower strata there are signs of great volcanic activity, and the northern heights of the Midland Valley remain to this day as evidence of this. At the end of the Old Red Sandstone age another outburst of volcanic action took place, resulting in the formation of a line of igneous hills to the south of the former.

These two lines of igneous rocks form on the one side the Northern Heights of the Lowlands, represented by the Garvock Hills behind Stonehaven, the Sidlaws, Ochils, Campsies, Kilpatrick Braes, Kilbarchan Hills, Cumbraes, Kingarth in Bute, and the south ends of Arran and Kintyre ; and, on the south side, the Southern Heights of the Lowlands —namely, the Garleton Hills in East Lothian, the Pentlands, Tinto, and the Douglas Hills with Cairntable, ending as the Carrick Hills from the Heads of Ayr to the Girvan valley.


PERTH
FIFE
KINROSS
STIRLING
DUMBARTON
WEST LOTHIAN
MIDLOTHIAN
EAST LOTHIAN
BERWICK
RENFREW
LANARK
PEEBLES
SELKIRK
ROXBURGH
AYR
DUMFRIES
NORTHUMBERLAND
Loch Katrine
Loch Lomond
Loch Long
R. Forth
R. Eden
Firth of Forth
R. Tweed
R. Ayr
R. Nith
R. Clyde
Callander
Stirling
Bannockburn
Cupar
St. Andrews
Largo
Kincoss
Methil
Dysart
Kirkcaldy
Lochgelly
Cowdenbeath
Dunfermline
Burntisland
Grangemouth
Bo'ness
Falkirk
Leith
Prestonpans
North Berwick
Dunbar
Haddington
Musselburgh
Tranent
Edinburgh
Dalkeith
Eyemouth
Berwick on Tweed
Norham
Coldstream
Kelso
Melrose
Galashiels
Peebles
Lanark
Coalburn
Douglas
Selkirk
Jedburgh
Hawick
Wooler
Moffat
Leadhills
Sanquhar
Dalmellington
Ochiltree
Ayr
Troon
Saltcoats
Irvine
Kilmarnock
Ardrossan
Largs
Barrhead
Hamilton
Motherwell
Coatbridge
Airdrie
Armadale
Bathgate
Linlithgow
Kirkintilloch
Clydebank
Dumbarton
Greenock
Johnstone
Paisley
Cumbernauld
Leadburn
Otterburn
Bellingham
Scale of Miles
0 5 10 15 20 25 30
× Pits outside Coalfields

Carboniferous : the Coal Measures

The really important rocks of Clydesdale and the Midland Valley, however, are of a later age than the Old Red Sandstone—the Carboniferous series, so called because they contain seams of coal. They form in Lanarkshire a series of layers nearly a mile in thickness, and have been divided into four great sections. The lowest of these, called the *Calciferous Sandstone*, contains, as the name implies, sandstones, generally red, with lime-stone, cement-stones, oil-shales, and ironstone, and with occasionally a thin seam of coal. In the neighbourhood of Glasgow they form a strip extending from near Stirling, behind the Campsies, through Killearn to Cardross, Dumbarton, the Vale of Leven, Helensburgh and Roseneath on the north side of the Clyde ; and they reappear on the south side from Port-Glasgow round the coast to Largs. Overlying these is the *Millstone Grit*, stretching south-west from Denny to Glasgow, and composed mainly of massive sandstones and thick beds of fire-clay, with occasional thin seams of coal and limestone. The top members of the series are the *Coal Measures*, from 1,500 to 2,000 feet thick, composed again of sandstones, oil shales, fire-clay, ironstone, and many valuable coal-seams. On the map of the Lowlands these strata form a large, irregular triangle, whose corners are at Alloa, Glasgow, and Lesmahagow respectively. This is the Lanarkshire coal-field, and it contains most of the large industrial towns of the Midland Valley. Another triangle has its base on the Ayrshire coast from Ardrossan to Ayr, and extends eastwards, sending off two forks, the one up the Irvine valley to Galston and Newmilns, connecting with the Lanarkshire field at Strathaven, and the other up the Ayr valley, connecting again with an outlying part of the Lanarkshire field at Muirkirk and Douglas. Lastly, on the top of the Coal Measures, and included in them, there are beds of red sandstone which contain no fossils, and are thus distinguished from the Old Red which lies far below the coal. These upper layers are very

well seen near Uddingston, where they attain their greatest thickness, and they are largely used for building purposes in the whole of the Bothwell area.

As is well known, coal is the compressed remains of plants which grew in a super-tropical climate, in an atmosphere heavily laden with carbonic acid gas, and rooted in soil which was not much above the water level and was subject to flooding and conversion into marshes and lagoons. The plants themselves, although of tree size, are related to the ferns and club-mosses of to-day—that is to say, they were green but flowerless, bearing no fruit or seed properly so called, but shedding millions of spores, like the brown dust found on the back of ferns and in puff-balls. This brown or yellow dust is very rich in resinous matter, and under the name of lycopodium is used for flashlights and for producing artificial lighting in theatres. Some of the finer-grained coals, such as cannel, are composed entirely of those spores, and burn almost like a taper when lit. In the Lesmahagow district indeed, where this coal was first found, the kitchen grates were made with a little shelf on the top rib on which a piece of cannel coal was burned to give light to the house—hence its local name, " licht coal " or cannel, that is, candle-coal.

Succession of Strata

Underneath the coal, which is the remains of the forest, we find, of course, the soil in which it grew. That soil is now represented by the underclay, a sandy fire-clay. Below this come sandstones, then shales light and dark, then limestone, and then another seam of coal, and the whole series of five begins over again like a repeating decimal. This steady succession tells the story of these ancient forests. In reading that story, however, we must work from the lower stratum upwards, not from the top downwards, as we find the strata in sinking a pit. First, then, the coal-plants grew on a marshy land-surface, now represented by the under-clay, and as the plants fell they rotted where they lay, clogging up the marsh, and

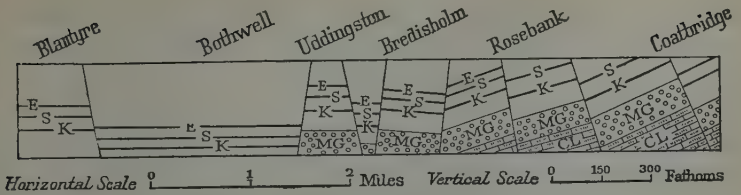
are now seen in the form of coal. Then the land sank, the sea flowed in, and shellfish and other marine creatures swarmed and died in it, forming the beds of limestone which are found above the lowest coal-seam. Then the land slowly rose, forming deep lagoons with mud deposits, now shale; then shallower lagoons with sand coming in from streams, now sandstones; lastly it rose so high as to serve as the soil for another growth of coal-plants, which formed the second seam of coal, and the cycle was again completed. Every seam of coal, therefore, however thin, represents a fresh land surface, and one can form a picture of the frequent earth-movements in Carboniferous times by observing the number of coal-seams in a single pit. The Clyde coalfield contains eleven beds of coal and seven of ironstone, all of workable value, but there are very many thin seams which would not repay the trouble of working, even with coal-cutting machines, for, generally speaking, a seam under four inches thick is of no practical value.

It must not be supposed that all the rocks of the Coal Measures are coal, or that coal is found only in these Measures. Coal is found all through the Carboniferous system, but of course the total thickness of the coal-seams is very small compared with the other strata which have to be pierced in sinking a coal-pit—say, an inch of coal for every yard of total depth. This is well shown in the following figures from Professor Dron's general section of the Hamilton area. (The depths of coal-pits, by the way, are measured in fathoms of six feet, like that of the sea.)

	fms.	ft.	in.
Upper Sandstones with coal seams . 6 in. to 16 in.	100	0	0
Palacecraig Ironstone	?		
Strata	11	0	0
Upper Coal . . . . . 1 ft. to	0	4	6
Strata	18	0	0
Ell Coal . . . . . 4 ft. to	1	3	0
Strata	11	0	0
Pyotshaw Coal . . . . . 0 to	0	4	0
Strata . . . . . 0 to	6	0	0

		fms.	ft.	in.
Main Coal	3 ft. 6 in. to	0	4	6
Strata		10	0	0
Humph Coal	0 to	0	3	6
Strata		5	0	0
Splint Coal	2 ft. 6 in. to	1	0	0
Strata		4	0	0
Virgin Coal	0 to	0	3	0
Strata		7	0	0
Musselband coal	0 to	0	4	0
Strata with Airdrie Blackband and other ironstones		16	0	0
Virtuewell Coal	1 ft. 4 in. to	0	3	0
Strata		5	0	0
Bellside Blackband Ironstone	0 to	0	0	6
Strata		7	0	0
Musselband Shale		0	1	0
Strata		7	0	0
Kiltongue Coal	2 ft. 6 in. to	1	0	0
Strata		3	0	0
Coal (sometimes a Cannel)	6 in. to	0	2	0
Strata		7	0	0
Upper Drumgray Coal		0	2	4
Strata		11	0	0
Lower Drumgray Coal		0	2	0
Strata with gas coals, etc.		45	0	0
Slaty-band Ironstone	5 in. to	0	1	0
Total maximum		280	2	4
Coal in the above, only		9	0	10

Coal working is greatly complicated by the fact that the various layers are not found as they were formed, lying one above the other in regular unbroken order. On the contrary, they have been subjected to two kinds of disturbance. One of these is "faults," which represent the slipping down of some portion of the field. The result is that a miner working along, say, the Ell coal finds that coal coming to a sudden end, as if it had been sliced off with a knife, and the next stroke of his pick is possibly into a limestone which ought to be far above the coal, or into Millstone Grit, which should



Faults in the Coal Measures (after Professor Dron).

E, Ell; S, Splint; K, Kiltongue; MG, Millstone Grit; CL, Carboniferous Limestone.

be far below it. This is well seen in the section above of the Clydesdale coalfield from Blantyre to Coatbridge, taken from Professor Dron's *Coalfields of Scotland*, in which he has traced the shifting positions of three well-known seams, the Ell, Splint, and Kiltongue coals.

The other kind of trouble is due to intrusion of volcanic rocks, which often occupy long straight cracks, many miles in length, forming dykes of hard whinstone, difficult to cut through. Many of these dykes extend up to the surface, and there, as they resist weathering much better than the softer sedimentary rocks, they stand out on the landscape like genuine dykes or artificial walls. One such dyke is very familiar to Clyde people; crossing from Ayrshire it forms the well-known "Lion Rock" at Millport, traverses the Big Cumbrae, and reappears in the same straight line at Kerrycroy in Bute, crossing that island also.

In some places, especially in river gorges, the coal seams crop out at the surface. This was the case in the prehistoric village at Overlee near Cathcart, already mentioned, and it is seen to-day in the bed of the Avon at Hamilton. In other places, as at Calderwood Glen, near East Kilbride, and in Craignethan Glen, near Crossford, the coal is reached, not by a vertical shaft or pit, but by a horizontal or a slightly inclined way, known as an "in-gaun e'e" (in-going eye). Most coal, however, is got by sinking shafts, sometimes to a considerable depth, and this means continuous engine-work for the removal not merely of the coal itself but of the much greater masses of comparatively useless strata, and also of

the underground water which is found in every pit. The unsightly " bings " or rubbish heaps, which surround every pit, are a blot upon the landscape, but it has recently been discovered that the clayey portion of these makes excellent bricks, and, moreover, contains so much coaly matter that less fuel is required to burn them. Many of the shales also contain a certain amount of iron, and the bricks formed from these are heavy, dark blue in colour, and fairly hard, and are therefore used for paving, especially in railway stations. It often happens that one man makes a fortune out of what another throws away, and some of the largest fortunes to-day have been obtained from the recovery of waste products such as these.

Although the ancient Britons of Overlee were the first people in the world to use coal, the credit for developing the Scottish and particularly the Lanarkshire coal mines must be given to the monks of Newbattle, near Dalkeith, in the Lothian coalfield. In the reign of Malcolm IV. (1153–1165) that monarch granted them a large tract of territory extending from Lothian to the Clyde, except the lands of Lochwood, which belonged to the bishops of Glasgow. These territories still bear the name of Monkland and form the parishes of Old and New Monkland, and it was here that the modern industrial development began in the exploitation not only of the coal but of the valuable blackband ironstone discovered by David Mushet in 1805. The effect of this was immediate; the population of the parishes rose from under 11,000 in 1811 to 50,500 in 1851, and now Coatbridge alone, with the adjacent townlets, far exceeds that figure.

The Iron Industry

From the details of the section quoted from Professor Dron, it will be seen that all the materials used in the production of iron may be got from the same pit—namely, ironstone, coal, limestone, and fire-clay. Fire-clay, extensively worked at Glenboig and Garnkirk, is required to line the

blast furnaces, and in order to stand the intense heat fire-bricks are made with as little clayey substance as possible, and consist of almost pure silica. Limestone, again, is required to produce the lime necessary as a flux—that is, a substance which will combine with the earthy parts of the iron ore so as to form a rough glass or slag, and will float on the top of the molten iron so that it may be run off before the iron is released. The limestone is useful in another way; in forming lime it parts with carbonic acid gas or carbon dioxide (CO_2), which in passing through the red-hot coal of the blast furnace becomes carbon monoxide (CO), and this again is the main reducing agent which, along with coal-gas, deprives the iron ore of its oxygen and leaves metallic iron. The smelting process is carried on in tall towers called blast furnaces, 50 to 70 feet high, and the proper mixture of iron ore, coal, and limestone is fed in at the top, while a blast of air is supplied below. In 1829 Neilson discovered that a great saving and increased efficiency could be got by employing heated air, and the hot blast which is now used everywhere was first put into operation at the Clyde Ironworks to the east of Glasgow. Down to recent times the furnace gases were allowed to escape and burned freely at the top of the furnace, lighting up the countryside for miles. "Dixon's Blazes" in this way saved many a gas bill in the south side of Glasgow, and a local poet has sung the praises of the Clyde Ironworks, then owned by Colin Dunlop, in the well-known strains:

"The mune does fu' weel when the mune's in the lift;
But oh! the loose limmer taks mony a shift,
Whiles here and whiles there and whiles under a hap;
But yours is the steady licht, Colin D'lap."

It is the same glare of the ironworks that Alexander Smith refers to in his well-known description of Glasgow as seen when coming from the south by the night express:

"The wild train plunges in the hills,
He shrieks across the midnight rills;
Streams through the shifting glare,

The war and flap of foundry fires,
That shake with light the sleeping shires;
And on the moorlands bare
He sees afar a crown of light
Hang o'er thee in the hollow night."

The pig iron produced in these blast furnaces is coarsely crystalline and contains a good deal of carbon. By repeated melting in foundry cupolas the carbon is reduced, and the metal becomes finely crystalline although still brittle. In this state it is called cast iron, and contains from $4\frac{1}{2}$ down to $1\frac{1}{2}$ per cent. of carbon. Cast iron worked in a "puddling" furnace loses nearly all its carbon, and the soft iron from the furnace is hammered, rolled, and "wrought" in various ways, becoming tough and fibrous. The final stage is steel, which contains a little carbon—from 1.5 per cent. for tool steel, down to 0.25 for mild steel. The steel towns of Scotland cluster round Motherwell, and are nearly all within the triangle of Glasgow–Mossend–Newmains, with important outliers at Carron, Glengarnock, and Lugar. In the years 1882 to 1885 Scotland produced half of the total steel output of the United Kingdom, but now yields less than a third; and while in 1913 there were 102 furnaces in blast, there are now only half that number. Of the pig iron produced in the United Kingdom, Cleveland and Durham produced 35 per cent. in 1913, and Scotland 14 per cent. It takes four tons of coal to make one ton of steel, so that the whole steel and engineering trade is based upon cheap coal.

The Scottish iron ores are now becoming exhausted. From 1882 to 1885 they formed one-eighth of the total ironstone of the United Kingdom; now they are only one-thirtieth. Most of our iron ore is now brought from Spain, and practically all into the Clyde, so far as Scotland is concerned, the leading Scottish ports in this respect being, in order: Glasgow, Ardrossan, Grangemouth, Ayr, and Troon. For high-class steel an ore is wanted which is rich in iron and contains little phosphorus and sulphur; Scottish ore is deficient in these respects, and is used only for forge and foundry work and for basic steel.

STEEL WORKS, MOTHERWELL.
(Photo: T. Johnstone, Motherwell.)

Industries based on Coal and Iron

The steel trade has two very important branches in which the Clyde district may be said to hold the world's record—namely, shipbuilding and locomotives. Fully half of all the ships of the world are built in Britain, the leading centres being the Clyde, the Tyne, Sunderland, and Belfast. We need not trace here the story of the growth of Clyde shipbuilding ; its present importance may be seen in the fact that in 1929, an average year, the Clyde yards turned out fully one-third of all the shipping built in the United Kingdom, with engines equal to one-half of its total horse-power. They produced more than three times as many ships, more than twice the tonnage, and nearly twice the horse-power of the Tyne, which came next on the list, and more than double the whole of Germany. The output of the Clyde represents 90 per cent. of all Scottish shipbuilding, and gives employment to more than 54,000 men.

Glasgow also specializes in locomotives. In 1924 the Scottish output, practically all in the Clyde area, was one-third of the United Kingdom total, employing 25,000 men. Besides the railway workshops, the North British Locomotive Works alone are capable of turning out 800 locomotives a year, and in addition there are extensive wagon and carriage works at Motherwell, Kilmarnock, and the railway centres. The year 1930 saw the advent of two engines of novel design, capable of doing 100 miles an hour, for the London services of the London, Midland, and Scottish and the London and North-Eastern Railways respectively.

The textile trades are also still based on coal as their source of power. These have changed in character during the last fifty years. Paisley shawls have gone, but the great thread-works remain, employing 10,000 workers. The centre of the British cotton trade has shifted to Lancashire, but the west of Scotland still produces art muslins, lace curtains, and fancy and decorative goods, employing some 5,000 workers and giving an output valued at about one

million sterling. In 1913 the exports from Glasgow showed nearly 288 million yards of cotton piece goods, while woollen goods were only 3½ million. The linen and woollen trades seem to be dying out in the west, except in Ayrshire, and jute has become definitely centred in Dundee.

A third group of industries depending on coal is the chemical section, in which Glasgow has always been particularly strong. The waste gases from blast furnaces and the tar and other waste products from gas-works are now the most profitable parts of these undertakings, giving rise to the manufacture of sulphate of ammonia, benzene, naphtha, carbolic acid, and the countless other products of coal-tar. The older chemical industries still flourish—the manufacture of soda, soap, glass, chromates, and cyanides ; and Nobel's firm specializes in explosives, manufactured under special conditions among the sand-hills at Ardeer, near Stevenston, Ayrshire. A recent development of the chemical trades was the combination in 1919 of the various oil companies of the Lanark–Lothian district into one company, Scottish Oils, Limited, with headquarters in Glasgow, and the laying of an oil pipe-line from Old Kilpatrick, on the Clyde, to the Admiralty station at Rosyth, on the Forth. Great and unsightly tanks for holding oil-fuel have been erected near Bowling, and a new era in shipbuilding was introduced by the *Aorangi*, built at Fairfield, a vessel of 17,500 tons which is propelled by four screws driven by motor engines—an " oiler " instead of a " steamer." This ship, which is to ply between Britain and New Zealand via Panama, saved two days on her maiden voyage, and was the first application to ocean shipping of the internal-combustion engine, which had been previously used only for motor launches and other small craft.

For the last two hundred years the industry of the Clyde valley has been based on coal; but coal does not grow, nor does it last for ever, and every ton taken from the earth is making the world poorer to that extent. Many estimates have been made of the amount of coal still in the ground,

and in 1917 it was calculated that Scotland possessed 12,315 million tons, of which the Lanarkshire coalfield contained 2,930 million. This is being used up at a pretty rapid rate. In 1913 the coal output of the United Kingdom was 287½ million tons, of which Scotland supplied one-seventh—42½ million tons—and employed in getting it no less than 147,540 workmen. Of the Scottish total, the Clyde valley or western field raised 25½ million tons, and the eastern field, mainly in Fife, 17 million tons. Fife coal is mainly for export, and is largely used as steam and bunker coal, while the Clyde coal is more prized for domestic and industrial use, with splint coal for furnaces. The Lanarkshire field has been worked for over a hundred years, and is now beginning to decline, and in spite of improved methods of winning the coal, especially from thin and deep seams, it would seem as if the future source of industrial power were to be hydro-electric. For this purpose great engineering works are now being carried out in Lochaber and the central Highlands, and the Falls of Clyde have been harnessed to supply the middle and lower wards of Lanarkshire. The Highland stations alone are estimated to give power equal to that produced from 1.85 million tons of coal per annum, and there would still be left an abundant surplus of water-power.

Chapter XV

SCHOOLS AND SCHOOLMASTERS

Church and School

For more than three hundred years Scotland has been famous for the excellence of its education, and it occupies a distinguished place in the number of capable men which it sends forth to all parts of the British Empire—prime ministers, archbishops, governors, generals, and "heids o' depairtments" generally.

Scottish schools date from the very earliest times. In the monastic and missionary systems of St. Ninian, St. Kentigern, and St. Columba, instruction went hand in hand with preaching on the one hand and study on the other, and this close connection between Church and School continued till 1872, and in some respects, indeed, still continues. There were many classical schools in the thirteenth century. The great Wallace was a pupil of Paisley Abbey School and Dundee Grammar School, and the present Ayr Academy can trace its history back to 1233, being therefore much older than any of the Scottish Universities, and 150 years older than Winchester, the oldest of the great English schools. In those early days Ayr was the leading town in the west of Scotland, having been created a royal burgh by William the Lion in 1202, and it played a prominent part in the thirteenth century. As a port it came next to Leith and Dundee, and held the leading place on the Clyde. In 1300 Glasgow, though a city with a bishop and a cathedral, had only about 1,500 inhabitants, and even as late as 1556 was far behind Ayr, being only the eleventh town in Scotland, and it is natural

therefore that Ayr should have been among the first towns in Scotland to have a centre of secondary education.

The Grammar School of Glasgow, now the High School, is older than the University, and it was attached to the Cathedral and even held its classes there as late as 1591. On the north side of the Cathedral there is a small low-roofed building which puzzled many people, but it has now been shown that this was the "Sang School," where boys were trained for singing the church services in pre-Reformation times. The Sang School and the Grammar School were the only places of instruction that Glasgow possessed down to 1603 or even a century later. Under Presbyterian rule the close connection between church and school continued, and the master or rector of the Grammar School was a member of Presbytery by reason of his office; and between the Reformation and the Union of the Crowns the teachers were appointed and the school was governed by the kirk session. After 1603 this control passed into the hands of the Town Council, and the Grammar School was thus the town's school down to 1872, when the Scottish Education Act handed it over to the newly created School Board. Now in 1930 all the public schools of the city are managed by the Town Council.

Knox's Scheme of Education

Similar histories could be related of the classical schools in Perth, Stirling, St. Andrews, and Edinburgh. James IV. by an Act in 1494 decreed that the eldest sons of barons and the larger landowners should have regular instruction in Latin and Logic; but the great Charter of Scottish education was Knox's *First Book of Discipline* in 1561. In this statesmanlike work, up to the level of which we have not risen even yet, Knox lays down the machinery for universal education on three different planes Every church, that is, every parish, was to have a schoolmaster appointed, able to teach at least grammar and the Latin tongue. It is to be remembered that Latin was then and for

two centuries afterwards an international language, spoken and written by all educated men, and that all lectures in colleges were given in that language ; even in the upper classes of the Grammar School pupils were punished for speaking in their mother-tongue, and the text-books used were all in Latin. Further, in every notable town (and he specified at least ten), there should be a college, in which the Arts, at least Logic and Rhetoric and Languages, should be taught by competent masters. Lastly, there were to be three universities, at St. Andrews, Glasgow, and Aberdeen—Edinburgh was added by James VI.—into which entrance should be determined solely by ability. The rich and powerful were exhorted, and if necessary compelled, to dedicate their sons to the profit of the Church and the Commonwealth, and the poor had their children supported in their schooling " so that the Commonwealth should have profit of them." Knox's idea was to train citizens for the service of Church and State, an idea that the great mass of the people have not yet grasped to-day. His scheme of training, which was religious throughout, as all good training is, covered five or six years in the parish schools, and other four years at least in the colleges or secondary schools, and at twenty-four years of age the young men, now thoroughly grounded, entered the university. What a falling-away from Knox to the actual state of matters a century later, when boys entered the universities at thirteen to fifteen—some only eleven !—and " took their degree of M.A. before they had begun to think."

The machinery thus planned, but only in small part created, operated more or less down to 1872. That it did not in every parish reach the high level of Knox's standard was due to the greed of the landowners, who seized the patrimony of the Roman Church which had been ear-marked for education ; still, in some parish schools all the subjects of the Cambridge " Little-go," or entrance examination, were successfully taught at the end of the eighteenth century. The range of subjects is shown by the catalogue of Glasgow Cathedral library in 1432, the second oldest in Scotland. It

GLASGOW HIGH SCHOOL.

contains the titles of 165 books; many of them are connected with Church services, and the rest are treatises on law, theology, metaphysics, and natural philosophy. Most were in Latin, but none in Greek, and as printing had not yet been invented, this library was considered quite large.

Glasgow Grammar School

The pupils of those days had a hard time. In the Grammar School of Glasgow lessons began at 5 a.m. in summer and 7 in winter, and lasted till about 5 or 6 p.m., with two intervals for meals. A time-table and scheme of work have come down to us from 1660, giving details of the week's work from 6 in the morning till 6 at night. On Saturday the pupils had a half-holiday, from 6 o'clock till 12 noon, after which they had Catechism for an hour or so. Sunday was very far from being a day of rest; they met in the school as usual for prayer and examination in the Scriptures; they were then marched off to the High Kirk, the master or rector in front, and the doctor or assistant teacher bringing up the rear. After service they were marched back to school to be examined on what they had heard; in some places they came to school four times, before and after each of the two services which were the common practice. In church the master took up his position near the door, lest any of his boys should try to slink out, and he often had a long wand to tap the heads of inattentive or sleepy pupils. Poor little wretches!

Holidays were few and far between—a couple of days at Candlemas and again at Whitsunday, and a summer vacation of ten days or a fortnight; very few burgh schools closed for so much as a month. On "Fastern's E'en" or Shrove Tuesday, the day before the beginning of Lent, occurring generally in February, every school was given up to cock-fighting, with the teacher presiding. Every boy who could afford it brought a cock to school, paying to the master twelve pennies Scots (about equal to one penny sterling) by way of entry-money, and the fighting between rival cocks took

place in the presence of the local gentry. All cocks killed in the fight went to the master, while those that would not fight were tied to a post in the playground and used as targets for broomsticks shied at a distance of twenty yards, at a halfpenny a throw. The income from this brutal "sport" formed no small part of the schoolmaster's salary, amounting in some districts to as much as a whole quarter's school fees.

Candlemas, 2nd February, gave another occasion for augmenting his salary. On that day the teacher sat at his desk, the tawse being banished from view, and awaited the "free gifts" of his scholars. These varied from sixpence upward, and each was welcomed according to its value. The smallest sum was received in dead silence; when it amounted to half a crown, a whole quarter's fee in the parish school, the master cried "Vivat!"; when it was twice that sum he exclaimed "Floreat bis!"; a higher sum was welcomed with "Floreat ter!"; and when the son of some local personage contributed gold the cry of triumph was "Gloriat!" The highest giver of the day was hailed as "King" or "Queen." In 1786 the Glasgow Town Council decreed that these cries should be dropped, but that the customary offerings should be continued. All these practices were due to the fact that teachers were miserably paid; very few parish schoolmasters had more than £10 a year, and even this was often made up by payments received for holding other offices, such as that of session-clerk, registrar, and precentor. Dr. Hewison tells of a schoolmaster in Kingarth, Bute, who was glad to resign his office on being promoted to the much better post of beadle!

The holidays of Glasgow Grammar School in 1786 were a summer vacation of five or six weeks, from the beginning of June till the end of Glasgow Fair. In addition they had Thursday, Friday, and Monday at the half-yearly Fast Days, Christmas Day, New Year's Day, Candlemas, May-day, the King's birthday, the day when the Deacons of the Trades were elected, and two or three days after the annual examination, at the discretion of the Lord Provost. The session

ended in the last week of September or the beginning of October with the Prize Day, on which occasion the scholars and the general public had to be accommodated in some church. The masters turned out in gowns and hoods, as they do still, the magistrates attended in their robes of office, and the Lord Provost, in full court dress and escorted by halberdiers, presided at the ceremony and presented the prizes. In Glasgow the last Friday of January was a holiday of very old standing. From a very remote period one student from each of the four "nations" in the natural philosophy class of the University used to repair to the Grammar School about the end of January, and request in Latin a holiday for the boys on the last Friday of that month. In return, four boys from the rector's class visited the principal and professors of the University with a similar request, both demands being always granted. Games and physical exercises formed no part of the school course, and the discipline was very severe; it is recorded that in 1699 a boy died from the effects of cruel punishment. In this case the teacher was tried for his life, but escaped with whipping and banishment.

The Training of Teachers

Teaching in the schools was not an occupation open to all; no one was allowed to teach without a licence from the bishop, or, later, from the Town Council. In the seventeenth century the Glasgow clergy complained to the magistrates about the multiplication of schools, and expressed their opinion that two were quite sufficient, the Grammar School and the Song School, and in 1658 the magistrates closed a private school which a woman had opened "at her own hand." This policy of strict Protection was followed later by a policy of Free Trade, in which any one could open a school and teach, without either licence or qualifications, a state of matters which continued down to 1872. Happy were those schools which had for dominie a "stickit minister," who had at least a knowledge of classics and mathematics; many teachers of

these "adventure" schools deserved the bitter jibe of G. B. Shaw, "Those who can, do; those who cannot, teach." Just before the passing of the Education Act of 1872 a report on the Glasgow schools showed that less than half of the children of school age were on the roll of any school, and that more than a fifth of the schools were indifferent or bad.

The first attempts at training teachers were made by Dr. Andrew Bell, who returned from Madras in 1796, and introduced the use of monitors, senior pupils who helped to teach the younger classes, the forerunners of the pupil-teachers of later days. The monitorial system was introduced into Glasgow by Joseph Lancaster in 1810, and Lancasterian schools, as they were called, were opened in Calton, Anderston, and Gorbals. The Calton school, now the oldest in Glasgow, is still in use as Green Street Day Industrial School, and numbers among its former pupils John Young, founder of the Scottish paraffin trade, and John G. Paton, the famous missionary to the New Hebrides.

Glasgow has the credit of possessing the first Normal School or training college for teachers in Great Britain. This was due to David Stow, who founded the college in Dundas Vale in 1836, and later on, as a result of the Disruption in 1843, the building now called the Stow School in Cowcaddens. These colleges were controlled by the Church of Scotland and the Free Church (later the United Free Church) respectively, but with the establishment of "Provincial Committees for the Training of Teachers" they were converted into ordinary schools, and a new training college was built at Jordanhill by the Glasgow Provincial Committee to supply all the west of Scotland. The Roman Catholic Church maintains training colleges of its own.

In some respects the traditions of the Scottish schools have been in marked contrast with those of England; boarding-schools were discouraged, boys and girls were taught together, and "gentle and semple" sat on the same benches. The oldest and highest schools in Scotland have been under popular management for centuries, and the ideal of Knox

of an educational ladder from the infant room to the university is realized to-day. There is ample financial assistance at every stage, and all that is demanded of the pupil is the necessary ability to profit by the education provided. So far as Glasgow is concerned, the number of pupils in private schools is a negligible quantity, and in the south-west of Scotland boarding-schools may be said not to exist. The existing classification of schools into primary and secondary is too familiar to need description.

Glasgow University

A bishop of Glasgow founded its cathedral, another built the historic bridges, and it was a third, Bishop Turnbull, who founded Glasgow University. Scottish students had been attending the great continental universities almost from their foundation. One of the "nations" in Padua University was that of the Scots, and as early as 1320 the Bishop of Moray founded the Scots College in Paris, which after many changes has again returned to Scottish hands. At the close of the great Papal Schism, Bishop Turnbull induced James II. to apply to the new Pope, Nicholas V., himself a great scholar and keen educationist, to found a university in Glasgow, "a notable place, enjoying a salubrious atmosphere and abundance of all the necessaries of life." Thus Glasgow University came into being in 1451; St. Andrews had already been founded by Bishop Wardlaw in 1411. The universities of Oxford and Cambridge, St. Andrews and Aberdeen, were all modelled on that of Paris, but Glasgow took its constitution from Bologna, although it also copied largely the customs of Louvain in Belgium, notably in the chief position being occupied by the Faculty of Arts. The infant college met at first in the cathedral itself, but afterwards found housing in the "Auld Pedagogy," now demolished, in the Rottenrow. In 1460 James, first Lord Hamilton, gave it a tenement of houses in the High Street with four acres of land extending east to the Molendinar Burn, and there it remained for 410 years,

being finally transferred to its present site at Gilmorehill in 1870. The old staircase was removed to the Arts Quadrangle of the new building, and the present lodge and gateway were part of the old High Street front. The original site is now occupied by the London and North-Eastern Railway, but the name College Street still keeps alive the mediæval memory.

For a whole century the university had a struggle for existence, and in the troublous times of Queen Mary it was reduced almost to extinction. In the next reign, however, Andrew Melville returned from the Continent, a scholar of European fame, who had been a student in Paris, a " regent " or teaching graduate in Poitiers, and a professor in Geneva. He was offered the principalship of either St. Andrews or Glasgow, and as the latter had the greater need he accepted Glasgow. At his instigation James VI. in 1577 granted the charter known as the *Nova Erectio*, and this " New Foundation " proved to be the second birth of the university. Melville revised and extended the Arts course, Greek was introduced for the first time in any Scottish university, and the M.A. course as planned by him compares very favourably indeed with that of to-day, including as it did Cosmography, Astronomy, History, Geography, and Physiology.

Student Life in the Olden Time

The session lasted ten months, from October to July, and half-way through it the students had a couple of days to go home and replenish their bag of oatmeal; these " meal days " are still observed as holidays. They began work at six in the morning, worked half-day on Saturday, and, like the boys in the Grammar School, had a heavy task on Sunday. In the morning they assembled in their class-rooms, and after religious exercises marched in procession to church both morning and afternoon, clad in their scarlet gowns, along with their principal and professors. At four o'clock the college bell rang, and they again gathered in their class-rooms, this time to be examined on the sermons they had heard, as well as

GLASGOW UNIVERSITY.
(Photo: Valentine and Sons, Ltd.)

on the portion of theology previously given out for study. This was followed by examination on the Catechism and exposition of the Confession of Faith, after which, thoroughly fatigued, no doubt, they retired to their lodgings; to "vague" in the street on Sunday evening was a punishable offence. Their collection in the kirk ladle was keenly noted; in 1703 the amount was so small that the regents were instructed to lift the collection in the class-rooms on Saturday, and hand it to the kirk-session.

The effects of the Restoration upon the university, in numbers and in morals and discipline, were deplorable, but under William III. things began to improve. At the beginning of the seventeenth century there were only 100 students in attendance; at the beginning of the nineteenth century there were 400; now there are over 5,000. Many of the eighteenth-century professors were outstanding men, Cullen and Black in physics and chemistry, Simson in mathematics, Adam Smith, author of the *Wealth of Nations* and founder of political economy, and Hutcheson and Reid, founders of the "Scottish School" of philosophy. Hutcheson was the first professor to lecture in English, all lectures having previously been given in Latin; Cullen was the first physician to lecture in English, but he retained Latin in teaching his botany class. One third of the students were Irish—"stupid Irish teagues," Reid called them; a good many were English, and a few were foreigners. Most of them were desperately poor; the "ladleman" or town's customs officer was instructed not to take his usual ladleful from the students' meal-pokes, and the kirk-session records contain numerous entries of doles of a few pence given to lads to help them on their way as they walked to college. They could manage to subsist on £10 a year, and thus the highest education was brought within the reach of the poorest lad in the country.

Glasgow Colleges

To Glasgow belongs the distinction of having the first women's college, originating in 1868, later formed into Queen Margaret College, and now part of the University. In 1929–30 the total number of university students was 5,527, of whom 1,682 were women.

Glasgow also claims the honour of possessing the first Technical College in Europe. This was founded in 1796 by Professor John Anderson of the University, the patron of James Watt. During his lifetime he had conducted with great success evening classes for working men, and by his will he left all his property "to the public for the good of mankind and the improvement of science, in an institution to be denominated Anderson's University." The "Andersonian," as it was called, had a splendid record in science teaching. Its first professor, Dr. Garnett, had nearly 1,000 students out of a population of about 70,000. Garnett was succeeded by Dr. Birkbeck, who formed a class for the *free* instruction of working men in mechanics and chemistry. This afterwards became the Mechanics' Institution, the forerunner of many such which were established in various parts of the country. A long line of brilliant teachers made the Andersonian the most famous school of Chemistry in Britain, special attention being given to Technical Chemistry. The Andersonian had also a medical faculty, sending its students to the Royal Infirmary for clinical training, as Gilmorehill sent its students to the Western. This faculty remained in the original home in George Street from 1800 till 1887, when it was disjoined, formed into Anderson's College Medical School, and transferred to Partick, at the gate of the Western Infirmary.

In 1886 the Andersonian, the Mechanics' Institution, and some other bodies, were united into what is now the Royal Technical College, the first and greatest in Europe; in 1929 it had 994 day and nearly 3,000 evening students, in addition to between 4,000 and 5,000 students in affiliated Continuation Classes. A department of this college has since taken inde-

pendent existence as the West of Scotland Agricultural College, with its main building in Blythswood Square and its Dairy School and practising farm at Kilmarnock and Auchencruive; classes attended at the Agricultural College qualify for graduation in Agriculture. The Technical College is affiliated to the University, and its students are eligible for degrees in Science. Further, the Technical College is linked up with advanced Continuation Classes over a wide area, comprising the shires of Lanark, Renfrew, Ayr, Dumbarton, Stirling, and Dumfries, and with detached schools as far apart as Clackmannanshire and Wigtownshire.

Other institutions for higher instruction in Glasgow are the Royal School of Art, the Scottish National College of Music, and the Commercial College.

Chapter XVI

SOCIAL SERVICES AND SOCIAL CONDITIONS

Pure Air

ANCIENT philosophers taught that all things were composed of four elements—earth, air, fire, and water. These are not "elements" in the modern scientific sense of the word, but they still remain the four things indispensable to our life. Earth to yield food and to give shelter, water to drink, pure air—which involves sunshine—to breathe, and fire—which we may call fossil sunshine—for heating and cooking; these are essential to our life as animals on this planet. A man may live without food for six or seven weeks, he may go without water for six or seven days, but without air he cannot live for as many minutes. Scotland generally has never had to suffer from want of food or of fire, and its abundant water supply and regular rainfall are the envy of less favoured lands; but it is only in modern times that we have begun to realize the importance of pure air and the health-giving powers of sunshine.

Clouds rob us of sunshine, but many of our clouds are of our own making, being caused by the stupidly wasteful use of coal, especially in our home fires. Our factory chimneys are more in evidence, but our domestic fires give off five or six times as much smoke as these. The manufacturer now knows that smoke means wasted coal and needless expense; the man in the street, or rather the woman in the house, has not yet learned that lesson. She is wedded to the hospitable glow of an open fire, and perhaps the only cure for the domestic smoke nuisance will be the introduction of smokeless fuel, a

soft coke which will burn in an ordinary grate; extensive plant for producing such a fuel has been laid down by the city of Glasgow at Dalmarnock. If this fuel can be put on the market at a price equal to or less than that of household coal, the problem will be solved.

The following facts, quoted from the report of the Medical Officer of Health, will show the magnitude and urgency of the problem. The total atmospheric deposit of soot, etc., over the whole city of Glasgow in 1929 was no less than 25 *tons per day*, or for the whole year, 9,278 tons, equal to half a ton of soot per acre, and this involved a loss, in ammonia and oils alone, of nearly half a million sterling. Much of this refuse matter gets into our lungs; that which falls to the ground causes perpetual dirt and consequent labour in washing and outlay for soap; and that which remains in the air for a time causes fogs of varied density, increases the rainfall—a merciful provision, however, helpful in its cleansing effects—and shuts off the sunlight, especially those ultra-violet invisible rays which seem to be Nature's greatest healing agent. It is evident, therefore, that the purification of the air is a problem which urgently demands our immediate attention, alike on grounds of health and of economy.

Water Supply: the Story of William Harley

Thanks to an abundant rainfall, the industrial area in the west of Scotland knows nothing of a water famine. Uddingston has an average rainfall of 30 inches per annum, and the amount rises towards the west, reaching 40 inches at Glasgow Observatory, 60 at Greenock, 80 on the Arrochar hills, and 100 at Fort William. Contrary to the common belief, a rainy year is a healthy year. This, of course, is due to the fact that the rain not only washes the back courts and streets and flushes the drains, but also washes the dust and germs out of the air, which is even more important from the health point of view.

The history of Glasgow's water supply is similar to that of

most modern towns, though on a larger scale. Down to 1800 all the water used was drawn from the Clyde or from wells, public and private. Cleland gives a list of thirty public wells in use in 1816, and some of these are still commemorated in such names as the Spoutmouth, Stockwell (the wooden or box well), the Lady Well, and Arns Well at the Green. The Stockwell at the West Port, now the head of Stockwell Street, was so much frequented that the crowds interfered with traffic in the Trongait. Various attempts were made as far back as 1783 to secure a more adequate supply, and from that time onward several sources were suggested, such as the Forth and Clyde Canal, the Clyde above Dalmarnock, and later on the Clyde above the Falls, the Cart and its tributaries, the Avon, the Endrick, Loch Lubnaig, and Loch Katrine, the last of which was finally adopted.

In this connection may be mentioned the romantic story of William Harley, a manufacturer in South Frederick Street. He owned some land at Willowbank and in the valley between Garnethill and Blythswood Hill, which is now occupied by Sauchiehall Street, and from the abundant springs there he laid pipes to a reservoir in what is now West Nile Street. From this reservoir he distributed the water in wheeled tanks, and retailed it to his customers at a halfpenny the stoup; and as the water was of excellent quality he had no lack of customers, and gathered from this source alone an income of £4,000 a year. He built Glasgow's first public baths in what is now Bath Street, marked by a bronze tablet in the Tramway Offices; he leased Blythswood Hill, then much higher than it is to-day, levelled it, built terraces round it, and laid out the highest part, now Blythswood Square, with a fountain and gardens. In addition, he practically created the wholesale milk supply. Glasgow's daily consumption of milk in 1804 demanded about 2,000 cows for a population of some 90,000; one-third of these cows were then housed in byres within the city, under very insanitary conditions, and the remainder were in farms three or four miles away. At the farms from four to twelve miles distant most

of the milk produced was made into butter and butter-milk, to be sold in the streets. Harley's entry into the dairy business arose out of his baths. Some of his customers having expressed a wish for a drink of milk after their bath, Harley first bought one cow, and then gradually increased his herd to 180, setting up extensive byres in Sauchiehall Road, as it was then called, and he began the baking of scones and bread to make use of any surplus milk, as most dairies do to-day. He soon became famous as a model dairy-farmer; he kept separate milk records for each cow, and insisted upon absolute purity, even inventing a special milk-can which prevented "watering"; he installed the first farm steam-engine to raise water for the byres and to work a straw-cutting machine and a machine for slicing potatoes and turnips, both of which were then novelties in the way of food-stuffs. The dairy was a notable show-place; it was visited by royalty, and in admission fees alone it drew £200 a year. Harley, with many others, came to grief in the great commercial crash which followed Waterloo, but he is one more notable example of the truth, not sufficiently recognized, that the uplift of a community is due mainly to the genius and energy of outstanding individuals, and that, as Carlyle said a hundred years ago, the history of a nation is largely the history of its Great Men.

Loch Katrine Water Supply

The growing demands of Glasgow soon outran even the energy of William Harley, and in 1806 a Water Company was formed to take water from the Clyde at Dalmarnock, Telford being the engineer. This was followed by the Cranstonhill Company, which at first drew water from the Clyde below Glasgow, a source which soon became polluted. In 1846 the rapid extension of building on the south side of the river led to the formation of the Gorbals Gravitation Company, drawing water from the Brock Burn, near Barrhead. Finally, in 1855, Parliament sanctioned the Corporation's

scheme to tap Loch Katrine, 34½ miles distant, and the completed works were opened by Queen Victoria on October 15, 1859.

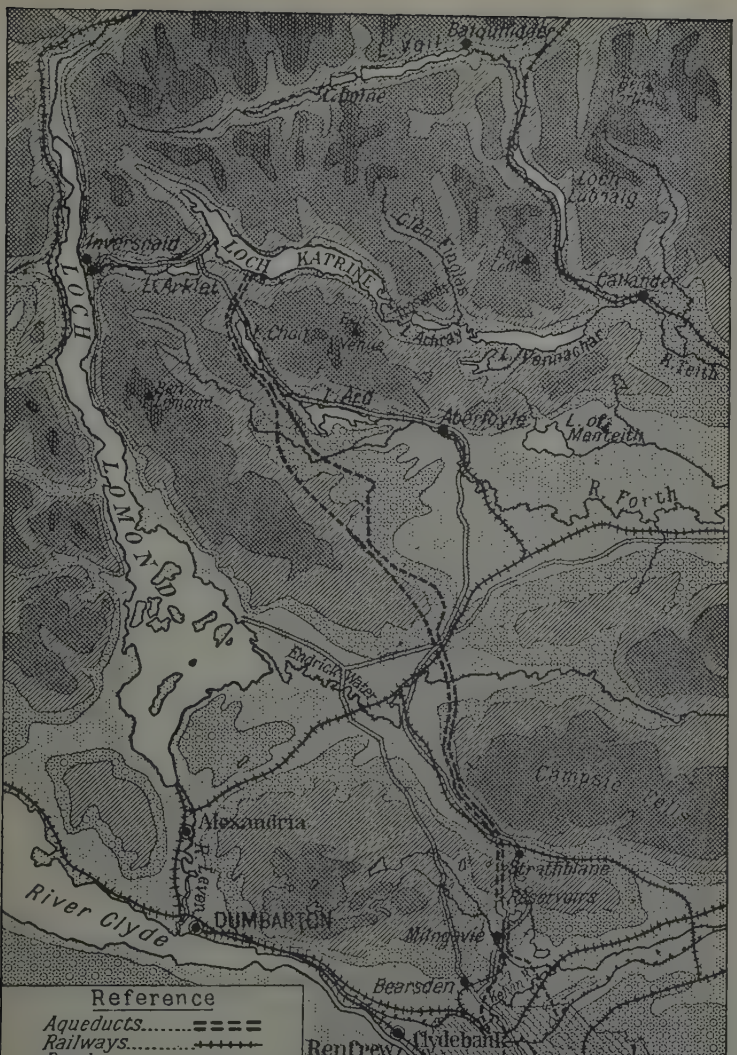
This great undertaking, at that time the greatest thing of its kind in the world, involved the raising of the water level in Loch Katrine by 5 feet, giving 12 feet deep of water over the whole loch available for supply. It also required the formation of an aqueduct to bring the water from the loch to the great service reservoir at Mugdock, Milngavie, a distance of 25¾ miles, in the construction of which valleys had to be crossed and hills tunnelled. Lastly, service pipes had to be laid from Mugdock reservoir to all parts of the city and district.

At present there are two aqueducts, almost parallel, the first 8 feet by 8 in cross section, capable of discharging 40,000,000 gallons a day, and the later one, 12 feet by 9, carrying 70,000,000 gallons—a total of 110,000,000 gallons per day, equal to 100 gallons per head of the population, compared with London's 23. There should be no dirt in the Glasgow district! There are now two reservoirs in Milngavie, the original Mugdock one, 62 acres, capable of holding 500,000,000 gallons, and the Craigmaddie reservoir of 88 acres, with a storage capacity of 700,000,000 gallons, the two together holding eighteen days' supply at the present rate of consumption. There are now eight main pipes, each 36 inches in diameter, conveying the water from these reservoirs to the city.

Loch Katrine water is so pure that it needs no filtering. Before leaving the loch it passes through fine wire netting to strain out floating leaves, sticks, etc., and on leaving the reservoirs it again passes through copper gauze, but no other treatment is needed. To prevent the pollution of the loch by possible building operations, the city has bought the feuing rights over the whole drainage area of Loch Katrine and Loch Arklet. This latter loch lies on the watershed between Loch Katrine and Loch Lomond, and discharges its water into Loch Lomond, forming the pretty falls of Inversnaid. The Corporation, however, have dammed up its western outlet, thus increasing the size of Loch Arklet and

at the same time raising its level, and the extra water thus obtained passes through a tunnel in the hill down to Loch Katrine, still leaving a sufficient supply for the falls at Inversnaid. The area of the loch has thus been more than doubled —from 207 acres to 551 acres—and its length increased from one mile to two. Loch Katrine is 364 feet above sea-level, and Loch Arklet 103 feet higher, and the annual rainfall in the district is over 80 inches, so that even the highest parts of Glasgow have no difficulty in either supply or pressure of water. The Corporation have also obtained powers, not yet used, to dam Glen Finlas, the stream of which flows under the Brig of Turk, and they retain an option on the waters of Loch Lubnaig, in Strathyre, and Lochs Voil and Doine in Balquhidder. The district supplied from Loch Katrine and Gorbals includes, besides the city itself, Strathblane and Milngavie on the line of route, and a wide suburban fringe comprising Bishopbriggs, Auchinairn, Millerston, Mount Vernon, Carmyle, Rutherglen, Barrhead, Nitshill, Renfrew, Yoker, Drumchapel, and Bearsden, containing in all about a million and a quarter people, one-fourth of the whole population of Scotland. The Gorbals works, still in use though now greatly extended, form a picturesque bit of landscape on the Lanarkshire and Ayrshire railway line. The water is drawn from the Brock Burn and collected in four reservoirs, having a water surface of 226 acres, and a storage capacity of fully a thousand million gallons, equal to 211 days' supply for its area at 5,000,000 gallons a day. This water passes through two sets of filters before being supplied to the southern districts of the town.

On the ordinary school maps there are no lakes shown in the south of Scotland except Loch Doon and St. Mary's Loch, neither of which is of any great size. An examination of the half-inch map, however, reveals the presence of quite a number of lakelets or ponds, some of them natural lakes enlarged, as Loch Thom above Greenock, but most of them artificial, made by damming up valleys, such as the Camphill Reservoir above Kilbirnie, which stores water for Paisley.



Map of Glasgow's Water Supply.

Each town of any considerable size has its own reservoir, sometimes far distant; Wishaw, for instance, had to go to Peden's Burn on the south-east side of the Lowthers, and the county supply for mid-Lanark is drawn from Glengavil in upper Avondale, while Clydebank and other riverine towns have abundant and convenient sources, natural and artificial, in the Kilpatrick Hills.

Lighting: Gas

If the nineteenth century may be called the age of steam, based on coal with gas as one of its by-products, the twentieth century bids fair to become the age of electricity, based increasingly on water-power where that is available. All through the centuries up to about 1750 there was no such thing as public lighting, and very little private lighting. Noon was still the middle of the day, as nature intended it to be, and people went to bed or at least went indoors at ten o'clock or earlier. Paraffin oil and paraffin wax were unknown, and the sole artificial light available was the feeble glimmer of wax candles in the homes of the rich, or the still feebler glimmer of tallow "dips" in poorer houses. Towards the end of the eighteenth century regulations were made ordering the citizens to maintain a certain number of street lamps, but these regulations were evaded to save trouble and expense, and at the time of Waterloo most of Great Britain was still in darkness after sunset.

In 1792, however, William Murdoch, a Cumnock man connected with the famous engineering firm of Boulton and Watt, discovered the use of coal-gas for lighting purposes, and the first public display of gas lighting was given by the firm in their Soho Works at Birmingham to celebrate the Treaty of Amiens. It was not till 1818 that certain Glasgow streets were lit by a private company, and in 1869 the city took over this company and another on the south side, and so began an important branch of municipal enterprise. The Corporation of Glasgow now supplies an area of about 100

square miles with gas for lighting, heating, and power—a territory stretching from Dunglass Castle to Chryston, a distance of sixteen miles from west to east, and from Milngavie to Burnside and Newlands, fully twelve miles from north to south. Practically every village has now its own private gas-works, so that the supply of gas no longer comes under the head of "public" services. Recently, however, there has been a movement, notably in the Middle Ward of Lanarkshire, to adopt a centralizing policy, and the County Council has bought up the private gas companies, intending to concentrate the supply of gas, as has already been done with water and electricity. Nearly all the coal-gas of the Middle Ward is now made at Uddingston.

Electricity: Recent Developments

In the 'seventies Lord Kelvin, then Sir William Thomson, professor of Natural Philosophy in the University, introduced electric lighting into his house at the College, and in 1879 the newly-built St. Enoch Station was lit with arc lamps by the British Electric Company, followed next year by Queen Street Station being lit by Crompton and Co. of Chelmsford. Muir and Mavor laid down electric plant in 1879–80, and in 1884 they lit up the General Post Office in Glasgow, the first post office in the kingdom to be so fitted. This proved such a success that electric lighting was introduced into the London and other offices. The city obtained from Parliament a Provisional Order in 1890, and took over Mavor and Coulson's works two years later; in February 1893, some of the streets were lit by arc lamps, and the general supply for private lighting was switched on in April. Later, as the demand for electric energy increased, not only for light but for power and heat, the Corporation built two great stations, at Port Dundas on the north side and at St. Andrew's Cross, Eglinton Toll, on the south side; while more recently still a super-station was erected at Dalmarnock. The power required for the Glasgow tramways, now running from Airdrie

in the east to Kilbarchan in the west, was generated in a separate station at Pinkston, but cables were laid from this to Port Dundas so as to supply extra current for emergencies such as fog.

As electricity plays a considerable part in daily life and is likely to play a still greater part in the future, it may be useful to explain some of the common terms used regarding it. A *volt* is the unit of electrical pressure, and is practically half of the pressure obtained from a dry cell such as is used for electric bells; an *ampere* is the unit of flow or current, and would be sufficient to supply eight 8-candle lamps at a pressure of 250 volts, the pressure usually supplied to houses. A *watt* is the unit of energy, and is the amount of energy supplied by one ampere of current at one volt pressure; half-watt lamps are very common in shops and even in houses; for larger measurements the *kilowatt* (k.w.) is used, equal to 1,000 watts, and a kilowatt is roughly equal to $1\frac{1}{3}$ horse-power, the unit usually employed in measuring engine-power. A *Board of Trade Unit* is one kilowatt per hour, which means the lighting of thirty-two 8-candle lamps for an hour, or one 8-candle lamp for thirty-two hours. Electricity is now in great demand for power, taking the place of steam, and also for heating, especially in certain branches of metallurgy in which even the heat of a furnace is not enough. Calcium carbide, for example, so much used for producing acetylene, demands the heat of an electric furnace, and in the Kinlochleven Works the electricity for this purpose is generated by turbines driven by water from a great reservoir $7\frac{1}{2}$ miles long and 1,000 feet above sea-level.

The greater the demand for electricity the more cheaply it can be produced. This is shown by the Glasgow Corporation figures for a period of thirty-six years:

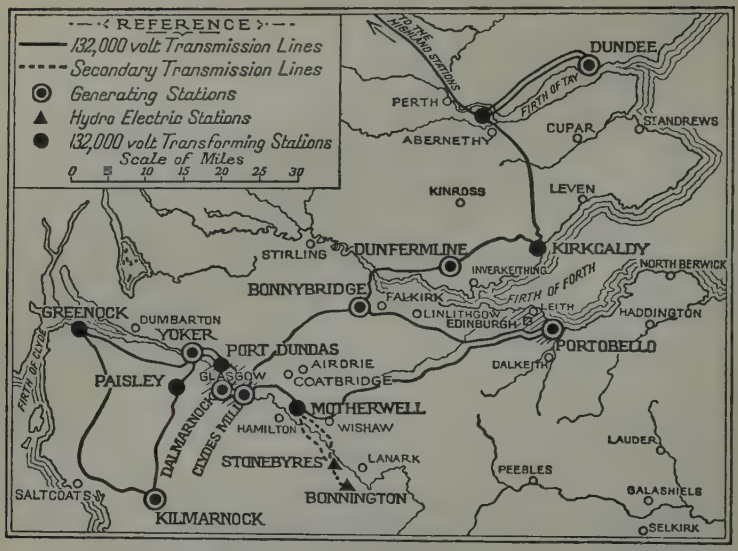
	No. of Consumers.	No. of Public Lamps.	Energy in K.W.	Price per B.O.T. Unit.
1893 . .	108	71	790	7*d.*
1929 . .	84,074	7,865	295,187	$1\frac{1}{2}$*d.*

The pressure of the Great War created a strong demand for standardizing and centralizing many departments of work, and among these the supply of electricity. Practically every burgh set up for itself electric works of some sort, but towards the end of 1924 a wholesale grouping of these was completed, in terms of which Glasgow was to supply its own area, all the surrounding district being supplied by the Clyde Valley Company.

A much more comprehensive scheme for the production and distribution of electricity was instituted by an Act of Parliament in 1926. A Central Electricity Board was appointed to divide the whole of England and Scotland into suitable areas, and to select or provide groups of large generating stations in each area. These are all linked together by means of a network of overhead lines, known as the " grid," into which all the stations send the current produced at the enormous pressure of 132,000 volts. This current is then supplied in the first instance to transforming and distributing stations at various points, where it is reduced to the lower voltages required for lighting, heating, or power, and distributed in the usual way to the towns, factories, and houses in their neighbourhood.

This explains that novel and somewhat unpleasing feature in the landscape which is seen in many parts of the industrial area of Scotland—the long lines of tall steel towers which seem to stalk over hill and dale like a procession of giant skeletons. These towers support the overhead lines which link up the generating stations of the " grid," and carry the high pressure electric current all over the area.

The Central Scotland area, with which we are chiefly concerned, includes the cities of Glasgow, Edinburgh, Dundee, and the whole of the counties of Ayr, Renfrew, the three Lothians, Clackmannan, Kinross, and Fife, together with the northern parts of Lanark and Peebles, and the southern parts of Dumbarton, Stirling, Perth, and Angus. The great generating stations are in Glasgow (Yoker, Dalmarnock, and Clyde's Mill), the Falls of Clyde hydro-electric stations (Bonnington



Sketch Map of the "Grid."

and Stonebyres), Kilmarnock, Bonnybridge, Edinburgh (Portobello), Dunfermline, and Dundee (Carolina Port). The main transforming stations for distribution are in Glasgow (Port Dundas), Paisley, Greenock, Saltcoats, Motherwell, and Kirkcaldy, in addition to sub-stations for distribution at the generating stations. Two other generating stations may also be established, one in the east and the other in the west of the area. From the Central Scotland area there are also lines which link it up with the adjoining areas—to the north, connecting with the Grampian hydro-electric stations, and to the south, connecting with Dumfries and Carlisle on the one side and with Berwick on the other.

With the further cheapening of electric energy, and reducing the number of smoky chimneys, we may hope to recover what has been lost for over a century—namely, pure air, blue sky, and a clear view of the lovely scenery which surrounds our centres of industrial activity.

The Removal and Treatment of Waste

The removal of waste is almost as necessary to public health as the supply of food, water, and air. A fire may die out from want of fuel, but it may also be choked out by its own ashes, and it is now believed that most of our illness is due to internal poisoning, caused by failure to remove the waste-products of the body as fast as they are formed.

In country districts the waste products of a household are all easily and profitably disposed of in the soil of the garden or in the kitchen fire. In small towns the solid waste, collected daily in bins, contains sufficient fuel to serve as a source of heat and even of electric lighting for the town, as was shown recently in Cambuslang. In larger communities any system of waste disposal is immensely complicated, not only by the quantity to be handled but also by its variety. Chemical works, for example, may be discharging acid waste at one time and alkaline waste at another ; dye-works have great quantities of coloured stuff to get rid of, and there is the constant presence of street washings, domestic sewage, and trade refuse, besides rain and snowfall. The old maxim of " the rain to the river, the sewage to the soil " works well in a country cottage, but on such a big scale it fails entirely. Part of the refuse is carried by water to the sewers. The comparatively solid and dry refuse contributed by ash-bins, street-sweepings, animal refuse from fish and meat shops, vegetable refuse, trade rubbish such as paper, shavings, sawdust, and packing materials, requires treatment by fire and not by water. The problem is of course most acute in Glasgow, owing to its great population and its manifold industries, and nowhere in the world has the problem been more satisfactorily solved. If Glasgow has not yet made an actual profit out of its waste, it has at least cut down the loss to the smallest figure.

As has been already shown, the Middle Ages were notorious for dirt, and it was not until 1800 that dirt was regarded as matter in the wrong place, and that the cleansing of the

city was looked upon as a public duty. So late as 1777 only two men were employed in street cleansing in Glasgow; at the end of that year a third man was employed, but till well on in the nineteenth century ladies had to wear pattens when going out—appliances which are never seen in Scotland to-day. Still, in spite of the general condition of things, Glasgow was always reckoned an exceptionally clean city, far in advance of any other Scottish town, and to this feature testimony is borne by visitors of all sorts. One writer in Cromwell's army of occupation says: "The town of Glasgow, though not so big nor so rich, yet to all seems a sweeter and more delyghtful place than Edinburgh;" and Richard Franck, writing of the same period, speaks of the "splendour and dignity of this city of Glasgow, which surpasseth most, if not all, the corporations in Scotland. The people were decently dressed, and such an exact decorum in every society represents it, to my apprehension, an emblem of England." Franck is a satirist with regard to every other place, but he describes the Glasgow of his day as "The nonsuch of Scotland, where an English florist may pick up a posie." Daniel Defoe, of *Robinson Crusoe* fame, writing half a century later, says of Glasgow that "it is one of the cleanliest, most beautiful, and best built cities in Great Britain."

The city waste may be classed as solid and liquid. Under the present system the solid matters are collected in bins daily from houses, shops, and warehouses; waste-paper is gathered in bags supplied for the purpose; and trade and stable refuse, as well as street sweepings, are collected daily. These are all taken to refuse destructors, and are for the most part burned in suitable furnaces, in some cases furnishing heat for electric power, and in every case yielding a valuable clinker which commands a ready sale. Waste-paper is collected separately and sold to paper manufacturers to make the coarser sorts of paper and packing material; even the tramway tickets yield revenue in this way. At the refuse dispatch works the process is different, and aims at waste recovery. The "slurry," or soft sweepings from the streets,

is tipped into special tanks where most of the water is gradually drained off, leaving a wet, pasty mass. To this is added the dry contents of the domestic bins, and also animal waste from butchers and fishmongers, the whole being thoroughly screened to remove scrap iron, glass, stones, etc., and then finely churned up in a mixing machine. The result is a manure which finds a ready sale among farmers, and is also used by the Corporation on their own farms, converting useless waste ground into valuable farm-land.

The various bog and waste lands bought for this purpose by the Corporation serve not only for utilizing the manure thus produced, but also give constant occupation to many of the unskilled labouring class who would otherwise be filling the ranks of the unemployed, and so the city saves on both sides of the account.

The scrap iron removed from the bins is separated and sold, and the tin cans which now bulk so prominently in rubbish-heaps are deprived of their tin (formerly of their solder as well), pressed into cakes of metal, and sold for scrap; a similar fate befalls enamelled ware, which is in good demand for blast furnaces, as the enamel acts as a flux in the treatment of the metal. In 1913 the total income from these waste products came to over £4,000.

The sewage of Glasgow, like that of most other towns, was formerly discharged into its river, which made the harbour very offensive, especially at low water in summer. In 1887, however, the Caledonian Railway Company projected a system of underground lines through the city, and the Corporation took advantage of this street upheaval to construct a new system of main intercepting drains, which receive the whole of the city sewage and conduct it for treatment to three great stations. To-day all sewage east of Glasgow Cross is conveyed to Dalmarnock station; all west of the Cross to Dalmuir; and all south side sewage to Shieldhall, between Govan and Renfrew. In these stations the treatment is partly mechanical, by screens and filters, partly chemical, by precipitation with alumina and lime, and partly biological,

depending on the activities of bacteria, aided by certain insects. The result is a clear and harmless liquid, which is discharged into the Clyde, and a small solid residue of low manurial value, which is sometimes pressed, dried, crushed, and sold, and sometimes removed as semi-solid sludge, taken out to the Firth of Clyde in hopper barges, along with the dredgings of the harbour, and dumped into the sea in eighty fathoms of water between Bute and Arran. The average amount of sewage thus treated is over 100 million gallons a day, and the full sewage scheme extends, if need be, from Carmyle on the east down to Bowling, over an area 15 miles long by 12 broad. The smaller towns in the district are of course content with much simpler systems, and treat their solid waste chiefly by cremation, and their sewage by septic tanks and filtration.

Public Health

After dirt, disease; Drink, Dirt, and Disease, form a trinity of evil. It seems to be more and more established that most diseases are due to dirt—matter in the wrong place—either to outer attacks by dirt in the form of bad air, foul gases, dust particles, and microbes of all sorts, or to the more stealthy undermining of the bodily welfare by internal dirt or self-poisoning. The age of sanitation is not yet far advanced—only a single lifetime—but already several of the chronic scourges of older times have practically disappeared, the general death-rate has fallen, and the expectation of life has gone up.

An old medical report by Professor Cowan on the vital statistics of Glasgow in 1840 makes interesting reading in this connection, especially when we consider the radical changes in the political situation since then. The Corn Laws were not yet repealed, the Chartists were rousing the people to new demands, trade unions were still illegal, and strikes were a strange phenomenon; yet much of what was written then could well have appeared to-day. The population of Glasgow was then fully a quarter of a

million—one-fourth of what it is now—and was increasing rapidly, not only through natural excess of births over deaths, but chiefly by immigration from the Highlands and from Ireland, largely of young women to work in the textile factories and the bleachfields. Fully one-quarter of all the workers were employed in the cotton industry; now all the textile workers together do not form even three per cent. of the employed population. Then, as now, the Irish population was increasing rapidly. In 1819 one in every nine inhabitants was Irish; in 1831, one in five; and in 1840, the date of Professor Cowan's report, one in four—the same as at present.

Epidemic disease was a scourge in those days. During the five years ending 1839 an average of 16,000 persons every year were affected by "fever," meaning typhus and typhoid, not then distinguished, scarlet fever, and smallpox. Now the first and last of these have practically disappeared, so much so that many doctors have never seen a case; there has not been a case of smallpox in Glasgow since 1921, and only one of typhus in 1922 and 1923. Plague, the scourge of the Middle Ages, and cholera, the dread of the nineteenth century, are now so rare that a single case imported from the East sets in motion the health organization of the whole country, and not merely that of the town or village affected. Yet there is still much to do by way of improvement. The cause of tubercle is known, but the public have not yet learned the value of fresh air and sunshine in this connection, nor has an effective vaccine or other antidote to this disease been discovered. Measles and scarlet fever are suspected to be caused by microbes, but these have not yet been definitely isolated, much less has an antitoxin been found. Finally, cancer remains without an explanation, and even rheumatism, almost a national disease, is still being treated, and often successfully, in spite of ignorance of its cause. On the other hand, much greater attention is now being paid to children from their earliest years, and with extended knowledge of food-stuffs, notably of vitamins, and of the dangers arising

from impure milk, such disorders of nutrition as rickets are disappearing. People do not yet realize that measles and whooping-cough are much more deadly than scarlet fever; many still hold the gross superstition that children must have these disorders, and the sooner the better.

Hospital Services

The communal treatment of ailments falls under three heads. First there are the great general hospitals like the Royal, Western, and Victoria Infirmaries in Glasgow, which not only treat all sorts of cases but act as clinical schools for the training of medical students, being in fact attached to the Faculty of Medicine of Glasgow University. To the same class belong many special hospitals such as the Royal Hospital for Sick Children and other institutions dealing with special groups of diseases. All these are maintained by voluntary contributions, and in Glasgow alone they provide 2,560 beds.

Secondly, there are special hospitals maintained by the Local Authority, either city, county, or parish; these comprise ordinary poor-law hospitals such as Barnhill and Stobhill in Glasgow, fever hospitals, and tuberculosis sanatoria. Some of these last are private institutions, maintained, like the infirmaries, by voluntary subscriptions. The usual reckoning of the hospital accommodation necessary is one bed per 1,000 of the population, but this is greatly exceeded in Glasgow, where the various classes of hospitals named provide over 11,000 beds for a population of less than $1\frac{1}{4}$ millions. It must be remembered, however, that the voluntary hospitals such as the Royal and the Western draw patients, especially urgent surgical cases, from the whole of the west of Scotland, and so far from having an excess of beds, every one of them has a waiting list of patients. The whole question of hospital accommodation in Scotland is at present the subject of a commission of inquiry. Mental hospitals, or asylums, are found in every county, either free and managed by the County Council or other local authority, or private

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GLASGOW ROYAL INFIRMARY.
(*Photo: Valentine and Sons, Ltd.*)

hospitals, where patients pay according to their means. Lastly, the necessary transport machinery is controlled by the St. Andrew's Ambulance Association, with a headquarters staff in Glasgow, and agents in every town and village of any size, wherever the telegraph or telephone wires run.

A notable feature of all this machinery for treating diseases is the provision in recent years of special hospitals for tuberculosis and for ailments of children. Many years ago, when King Edward, then Prince of Wales, was told that certain diseases were preventible, he replied, "Then why are they not prevented?" Prevention, moreover, is better than cure, and the most useful agencies in this connection are the schemes of maternity and child welfare, followed up by infant visitation, day nurseries, and school cliniques, all of which are not only reducing the infant death-rate, but building up a people of a sturdier physique and a greater power of resisting disease.

Housing: Density of Population

The health of the people depends so much upon pure air and sunshine that it cannot be discussed apart from the question of housing; and here, it must be confessed, Scotland lags far behind England, the largest towns being the worst. Glasgow comes out badly in this respect, compared with English cities. Before the extension of its boundaries in 1925 its population of over a million persons in an area of 19,000 acres gave a density of 57 persons to the acre. Liverpool has only $33\frac{1}{3}$, Manchester $33\frac{2}{3}$, Birmingham 21, Sheffield 16, Bradford 12, Leeds 16, Belfast $25\frac{1}{2}$, and Edinburgh only 13. Bristol, with a population only one-third of Glasgow, has almost the same area, giving a density of $20\frac{1}{2}$. The extension of the city boundaries in 1925 added some 10,000 acres to its area, but less than 20,000 to its population, so that the average density is now reduced to less than 38 persons per acre; but Glasgow still remains the most congested city in the kingdom. This explains the crowded streets of the city, and partly accounts for the outstanding success of its tramways, almost

alone among municipal tramway systems: there are more passengers per mile than in any other town. What is true of Glasgow holds good in varying measure for all the industrial towns of the Clyde area, and it must be remembered that the "industrial belt" contains more than half the total population of Scotland, and, moreover, is draining into itself the country districts, as every census shows. With all this handicap of congestion the death-rate of Glasgow does not compare very badly with that of other large towns, as is shown by the following figures for 1923: Glasgow 13.7 per 1,000 per annum, Edinburgh 13.8, Dundee 14.3, Aberdeen 13.5, London 11.2, Liverpool 13.8, Manchester 13.4, and Birmingham 11.0.

Here a national distinction comes into play. The Englishman's house is his castle, with its own front door and back yard, however small. It is built of brick, and is rarely more than two storeys high, and the rooms, though small, are numerous. A Durham pitman's house has four or five rooms, while a Scottish collier earning similar wages would be content with a "but-and-ben," or even a single apartment if he could get it. The Scottish town-dwellers, on the other hand, cluster in "lands," or tenements, generally four storeys high, with a common "close" and stair. These are built of stone and last a hundred years or more; by that time they have become slums, for districts always degenerate, and houses which once contained three or four apartments are divided into smaller ones, with the result that certain old wards of Glasgow have as many as seven hundred persons to the acre, with a correspondingly high infant death-rate. The Scotsman will not have the vertical style of house so common in England; he prefers the flat system, with all the rooms on the same level. His rooms are larger than those of his English brother, and his rent higher, owing to the greater cost of stone houses as compared with brick. When every allowance is made for differences of race and climate, it has to be confessed that the Scottish working man has a much lower standard of comfort than the Englishman. He has much more money in the Savings Bank, to be sure, but it might pay him in the long

run either to rent a bigger house in the city, or to spend the difference in a season ticket to a house built ten miles out of the town, where pure air may be had. This, however, in the meantime, he will not do. When the Singer Company moved their sewing-machine factory out to Kilbowie a generation ago, some of their workers followed them from Bridgeton to live in the suburbs, but to this day train-load after train-load of Singer's workers come pouring out and in between Bridgeton and Kilbowie. More than forty years ago John Bright, Rector of Glasgow University, startled the community by his rectorial address on " Life in One Room," and although the lesson was learned it has not yet been fully translated into practice. About two-thirds of the Scottish townsfolk live in houses of one or two apartments, whereas fully three-fourths of the English townsfolk have more than three apartments.

Improvement in Public Health

The great improvement in the health of the people during the last fifty years, and the close connection between health and fresh-air and sunlight, is strikingly shown in a report recently issued by the Public Health Department of Glasgow. Fifty years ago a boy born in the city had an expectation of life of 30.93 years, but now his expectation is 44.4 years ; in the same period the infant death-rate had fallen from 181.8 per 1,000 living to 124.6 in 1921—in other words, the expectation of life among boys had increased by 17½ years. In the same way, the infant death-rate for girls had fallen from 158.2 in 1871 to 99 in 1921, and the expectation of life had risen from 32.61 years to 52.22, an increase of 19½ years ; that is, those who are now born live on the average from 17 to 19 years longer than those born fifty years ago.

Another way of stating this advance in the last half-century is to say that in 1871 one-half of the males in the population died before the age of 29, and one-half of the females before the age of 30 ; now these ages are 58 and 62, a gain of about 30 years. This gain is chiefly in adult life, and is certainly

due to the better foundations now being laid in infancy and childhood, and the outdoor life now more generally lived by young people of both sexes. The connection between health and housing, which practically means air and sunshine, is also brought out in this report. In single apartment houses the expectation of life for boys of 10 is 46.96 years, for those in houses of two apartments 49.56, practically the same, but for those in houses of three apartments it is 52.52, and of four apartments or more, 53.09 years. The similar figures for girls of 10 are 46.85, 49.90, 54.71, and 58.80.

Thrift

In spite of the fact that he lives more poorly, the Scot, and especially the Glasgow workman, has more money than the Englishman, for in 1929 the Glasgow Savings Bank, the largest institution of its kind in the United Kingdom, held £24,000,000 of the people's savings, mostly in small sums, not to speak of the deposits in the Post-Office Banks, and the immense sums invested in War Savings Certificates. Nearly two-thirds of this huge sum is represented by small accounts of less than £30, and the number of depositors was 313,000, or 1 in every 4 of the whole population of Glasgow. Similar reports have been produced by Savings Banks in Paisley, Greenock, and other industrial towns, all going to prove that even in a time of abnormal depression, and in spite of much evil advice to the contrary, the Scot still gives thrift a prominent place among the practical virtues—as Burns has put it :

> " Not for to hide it in a hedge
> Or on a train attendant,
> But for the glorious privilege
> Of being independent."

The same tale is told by the Committee for Savings Certificates, Glasgow leading the way with one and a half million pounds of the third series, more than three times the amount of Edinburgh, which comes next on the list. The holders of

these certificates are really shareholders in the British Government as a going concern, and are not likely to be led astray by frothy theories of economics; they have a share in the business, and an interest in its prosperity.

Intellect, industry, perseverance, prudence, thrift—these, according to General Sir Ian Hamilton, are the practical qualities which have given our little mother-land the foremost place in that great confederation of nations which men call the British Empire. When these qualities are supplemented by a perfervid love of country, that tenderness towards the weak which is expressed in the old phrase "the kindly Scot," and the inspiration of the majestic opening of our Shorter Catechism, "Man's chief end is to glorify God and enjoy Him for ever," we know the secret of its commanding position and the source of its power.

Chapter XVII

"DOON THE WATTER"

A Varied Environment

GLASGOW has been humorously described as the finest city in the world—to get out of. Certainly, in pre-war days, there was no place in the world which enjoyed so cheap railway and steamboat fares, and no place where in a one-day excursion the traveller could enjoy so charming a variety of choice scenery. The East Coast generally presents, in front, a wide expanse of open sea and an unbroken horizon; but the Firth of Clyde, with its many sea-lochs like the extended fingers of a friendly hand, offers endless variety of scenery and shore,—

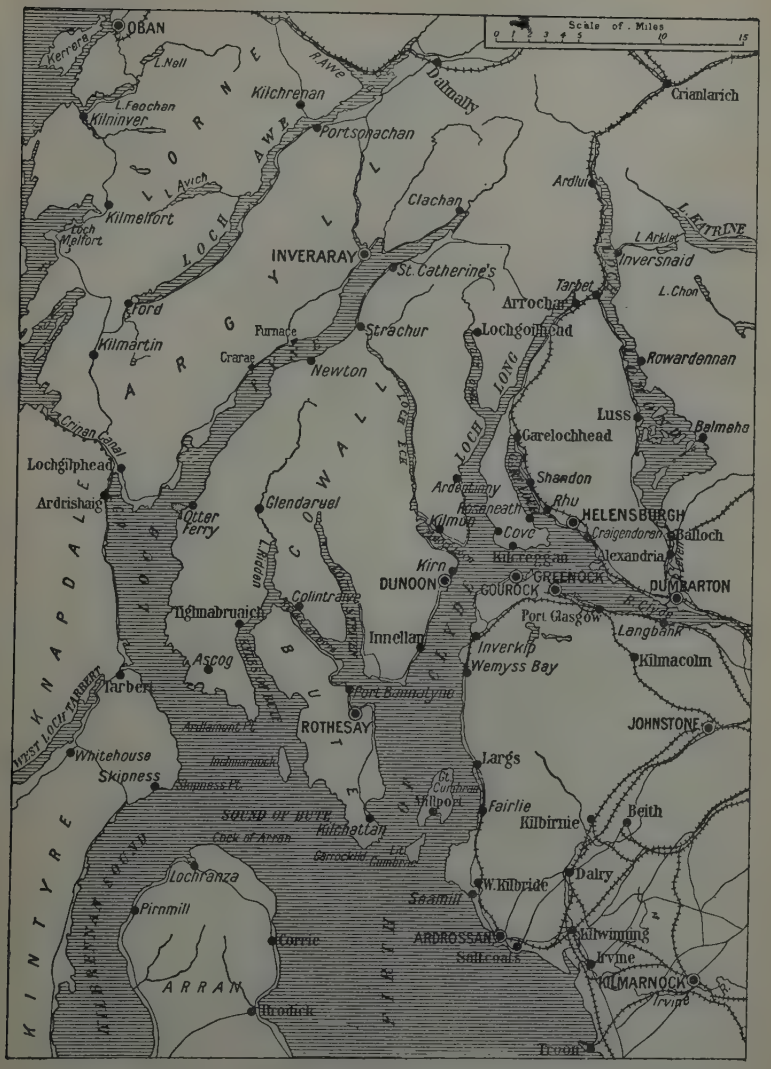
> "... with promontory, creek, and bay,
> And islands that empurpled bright
> Floated amid the livelier light."

There are long and wide stretches of sand and shingly or rocky beaches for bathers, as on the Ayrshire side; steep, vertical cliffs as at Dippen and the Mull; deep gloomy glens as at Sannox and Glen Croe; everywhere there is the real blue water of the Atlantic Ocean—neither the olive-grey of the North Sea nor the light green of the English Channel; there are natural harbours which could hold the British fleet, with depths equal to that of the ocean beyond the Hebrides, and bordered by hills 3,000 feet high and more; there are the cheapest and the safest places in the world for boating, the birthplace of British yachting, and the headquarters of yacht-building. When the Prince of Monaco, a keen biologist, was desirous of establishing a first-class station for the study of marine life, he sent experts all over the world to discover the

waters most suitable for his purpose, and the final selection lay between Millport and Naples. Naturally the Italian prince fixed on Naples, but Millport has its own marine station, the full attractions of which Glasgow folk have not yet learned. Owing to the sheltered situation of the Upper Firth there may be found at low tide, or in shallow water, beautiful marine forms which in more exposed waters seek shelter deeper down, and by a strange combination of circumstances it is possible to find Spanish creatures which have been carried by currents, and at the same time Arctic specimens, survivors of the glacial eras of the dim past of our own country.

The Approach by Sea

The railway approach to a great city is generally sordid, through tunnels and cuttings, or between vertical sections of houses like human pigeon-holes. There are three cities which the visitor should always approach by sea, and on a flood tide—Venice, London, and Glasgow—and the finest of these approaches is the last. Americans are not usually generous in their praise of other lands, and yet John Burroughs, an authority on country life, writes thus of sailing up the Clyde : " The scenery of the Clyde is unequalled by any other approach to Europe. It is Europe, abridged and assorted, and passed before you in the space of a few hours ; the highlands and lochs and castle-crowned crags on the one hand, and the lowlands with their parks and farms, their manor-halls and matchless verdure on the other. The eye is conservative, and loves a look of permanence and order, of peace and contentment ; and these Scotch shores, with their stone houses, compact masonry, clean fields, grazing herds, ivied walls, massive foliage, perfect roads, verdant mountains, etc., fill all the conditions. . . . [Above Greenock] not a little of the charm and novelty was the impression it made as of going afield in an ocean steamer. You are at sea amid verdant parks and fields of clover and grain. You behold farm occupations—sowing, planting, ploughing—as from the middle of



The Clyde Lochs.

the Atlantic. The ship steers her way amid turnip-fields and broad acres of newly-planted potatoes. You are not surprised that she needs piloting. Presently we come to the shipbuilding yards of the Clyde, where rural pastoral scenes are strangely mingled with those of quite another sort. 'First a cow, and then an iron ship.' Here a pasture, or a meadow, or a field of wheat or oats, and close beside it, without an inch of waste or neutral ground between, rise the skeletons of innumerable ships, like a forest of slender growths of iron, with the workmen hammering amid it, like so many noisy woodpeckers. It is doubtful if such a scene can be witnessed anywhere else in the world—an enormous mechanical, commercial, and architectural interest, alternating with the quiet and simplicity of inland farms and home occupations. You could leap from the deck of a half-finished ocean steamer into a field of waving wheat. To see such a brood of ships, the largest in the world, hatched upon the banks of such a placid little river, amid such quiet country scenes, is a novel experience. But this is Britain; a little island, with little lakes, little rivers, quiet bosky fields, but mighty interests and powers that reach round the world."

Burroughs as a farmer was much interested in the rural aspect of the river, but a Scotsman who knows the story of his country looks on the same scene with very different eyes, and sees unrolling a long panorama of history and romance —"tradition, legend, tune, and song." At Kilpatrick the Roman wall ended and St. Patrick was born; at Bowling the Forth and Clyde Canal comes in from the east; across the river the heights of Paisley recall the Roman station, and the Braes of Gleniffer her sweetest of singers. Dumbarton Castle is in itself an epitome of Scottish history: the Theodosia of the Romans, the *castrum Arthuri* of the great king of romance, the Balclutha of Ossian, the Alcluyd of King Roderick, the spoil of Olaf the White in the ninth century, the prize captured by Wallace and Bruce and Crawford of Jordanhill, the prison of Wallace on his way to Westminster Hall, the embarking stage of the infant Queen Mary on her way to France

from quiet Inchmahome, long Scotland's chief naval station, and now echoing to the ring of hammers forging Britain's walls no longer wooden. Then at Dunglass is Henry Bell's monument, and in Rhu churchyard his grave; at Cardross Robert Bruce died; at Greenock James Watt was born; Burns's "Highland Mary" lies in Greenock, and Tannahill sang of "The Lass o' Arranteenie" up Loch Long. There is no end to it, and one can only repeat the words of Johnson: "Whatever withdraws us from the power of our senses; whatever makes the past, the distant, or the future predominate over the present, advances us in the dignity of thinking beings. Far from me and from my friends be such frigid philosophy as may conduct us indifferent and unmoved over any ground which has been dignified by wisdom, bravery, or virtue. That man is little to be envied, whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona!" The pity is that Clydeside contains to-day too many "dead souls," as Sir Walter would have called them, who make it their boast that they have no patriotic ties.

Travel Facilities

The time-honoured way from the city to this earthly paradise is by steamer all the way from the Broomielaw, and for a visitor this is still the most interesting and educative route. Most Clydeside people are so familiar with the upper reaches that they usually prefer to save time by combining railway and steamer, and the Clyde is well supplied with the means of doing so. On the northern side the London and North-Eastern Railway have their steamboat terminus at Craigendoran, near Helensburgh, as well as the West Highland railway line running up the three lochs—Gareloch, Loch Long, and Loch Lomond. The southern shore is well served by the London, Midland, and Scottish Railway, with termini at Greenock, Gourock, Wemyss Bay, and Fairlie for the Upper Firth, including Kilbrannan Sound and Loch Fyne, and at

Ardrossan for Arran, the Isle of Man, and Ireland; while during the summer season daily trips are run at excursion rates round Bute, round Arran, round Ailsa Craig, the round of the lochs, etc., and season tickets are issued available for daily sailing, except on Sundays, by any steamer and on any route. Different districts have their favourite holiday resorts; Paisley used to affect Largs; upper Bridgeton went to Girvan, the lower being content with Rothesay, a better bargain; while the more leisured classes, who could spend a couple of months instead of ten days at the Fair, enjoyed "Nature's wildest grandeur" under natural and often primitive conditions in Arran.

The Sea-Lochs and their Story

To the chance visitor the sea and other lochs on the Clyde are at first confusing; but there are certain physical conditions which have determined their forms and their places. On a map of Britain it will be seen that almost all the larger rivers flow south-east or easterly, showing that the main slope of the island is from north-west to south-east; it has already been mentioned that the Clyde is the only important river in Britain which flows in the opposite direction, or north-west. The oldest river valleys were naturally formed on the original slope of the land, and so are known as "consequent" valleys, and many of the Clyde lochs are seen to fill such glens running from north-west to south-east. A geological map of Scotland, however, shows that the boundary lines of the various rock systems extend across the country from north-east to south-west, as is seen in the great fault from Stonehaven to Gourock, and this line of outcrop has given rise to another set of valleys, "subsequent" valleys, as they are called, running from north-east to south-west, almost at right angles to the former set. Lastly, the glaciers of the Great Ice Age, coming down from Argyll and Lochaber, deepened these glens, carving out their bottoms down to the solid rock, and so producing the unusual spectacle of narrow sea-lochs, or fiords, like those of Norway,

EXCURSION STEAMER LEAVING THE BROOMIELAW.

(Photo: Robert Halstead, Glasgow.)

which run inland for miles between hills from 2,000 to 3,000 feet high, and yet are deeper than the open sea—more than twice as deep as the North Sea. Another feature of the Clyde lochs, due also to their origin, is the shallow part which marks the former foot of the drowned glen. Loch Fyne, for example, is fifty fathoms deep at Strachur ; but at Otter Ferry, fifteen miles nearer the sea, it shallows to ten ; and at Rhu a slight rise in the land would make the Gareloch a fresh-water lake. On the other hand, a fall of twenty-five feet in the Vale of Leven would once more open Loch Lomond to the tides, and yet this lake is a hundred fathoms deep in its upper part, between Tarbet and Inversnaid. This grouping of the lochs as occupying either " consequent " or " subsequent " valleys can be extended to include the neighbouring glens, such as the Loch Eck line, Glen Finart, Glendaruel, Loch Gilp and the line of the Crinan Canal, Loch Awe, and the sea-lochs between Oban and West Loch Tarbert.

Lochs, Glens, and Roads

This criss-cross system of valleys has naturally determined the road system of the whole district, especially in Dumbartonshire and Argyll, and affords easy passage for traffic through what is on the face of it a difficult piece of country. Thus the upper end of Loch Lomond gives access by Glen Falloch to Crianlarich and the great east-west valley from the Tay to Oban, as well as to Glencoe, Ballachulish, the Great Glen and Inverness, to which town this is, in fact, the shortest route from Glasgow. At Tarbet a short and low cross-valley leads in a mile and a half to Loch Long at Arrochar, and so over " Rest and be Thankful," 860 feet high, to Loch Fyne, Inveraray, Oban, and Campbeltown ; while from Inversnaid a steeper valley leads eastwards to Loch Arklet and the Trossachs. In like fashion Loch Goil leads north-west by Hell's Glen to St. Catherine's on Loch Fyne ; the Gareloch leads over by Whistlefield to Loch Long ; and at Ardentinny Glen Finart runs north-west to another Whistlefield, there joining

the splendid highway from Dunoon by Loch Eck to Strachur on Loch Fyne.

In these days of road-making it may be useful to mention some gaps which might profitably be filled on the road-map: first, a continuation of the road from Ardentinny to Lochgoilhead, so as to connect with the Hell's Glen road to Loch Fyne; second, a road from Lochgoilhead round "Argyll's Bowling-Green" to Mark, in Glasgow's Highland estate of Ardgoil, with a ferry at Portincaple to take motor traffic from the Gareloch; third, a road round the north end of Bute, opening up the Kyles to foot and carriage traffic; fourth, a continuation of the Trossachs road along the north side of Loch Katrine and round to Stronaclachar, for Inversnaid and Loch Lomond on the one hand, and for Loch Ard and Aberfoyle on the other; and lastly, a good road up the east side of Loch Lomond from Balmaha to Inversnaid or Ardlui. Most useful of all would be a carriage ferry, similar to that at Dundee, from the Cloch to Dunoon, giving direct access for motors to the whole of Cowal and some of the most beautiful scenery in the west of Scotland.

The best handbook to the Firth, in spite of its having been written threescore and ten years ago, is still Hugh Macdonald's *Days at the Coast*, the companion volume to his *Rambles round Glasgow*. In the immediate neighbourhood of the city so many changes have taken place since Macdonald's time that the latter book is now out of date as regards a seven-mile radius from Glasgow, and must be supplemented by such excellent modern handbooks as those of Mr. Brotchie, and the guide-books issued by the Corporation Tramway Department. At the coast, however, the changes have been relatively few; piers have been built where ferries were before, and new steamer, railway, and motor routes have been opened; but the lochs and the hills remain unaltered and unspoilt, and the *Days at the Coast* is still the best companion for the rainy days on the Firth—of which there are plenty.

Loch Lomond

Loch Lomond, the largest lake in Britain and the "Queen of Scottish Lakes," is included in our view of the coast, because, though not now a sea-loch, it was so in early British times, and even yet is only twenty-three feet above sea-level.

LOCH LOMOND AND BEN LOMOND.

The names Lomond, Leven, and Levenax or Lennox, are all from the Gaelic word for an elm-tree, and the same conjunction of Lomond and Leven is found in Fife. The loch is 22 miles long, and evidently consists of two parts. The upper portion is typically Highland, long, narrow, and deep, bordered by hills over 3,000 feet high. This portion is nowhere more than a mile broad, but reaches a depth of 105

fathoms between Tarbet and Inversnaid, a depth twice as great as that of the sea off the Mull of Kintyre. The lower portion is five miles in width, and nowhere more than 60 fathoms deep, though this again is deeper than the open sea, and the surface is beautifully broken up by most of its thirty islands. To the north-east of the loch is the Macgregor country, extending from Balmaha to the Braes o' Balquhidder, and including Loch Katrine and the whole Trossachs district. At Tarbet a low glen, only forty feet above sea-level, leads west to Arrochar on Loch Long, and through this pass the road to Inveraray and the West Highland railway line, which comes from the Gareloch and Loch Long to Arrochar, and passes along upper Loch Lomond and through Glen Falloch to Crianlarich and Fort William. The name "Tarbert," which often occurs in various forms, is a Gaelic word meaning "boat-draught," a place where boats can be drawn overland. This Tarbet on Loch Lomond, as we have seen, was used in that way by Haco shortly before the battle of Largs, when a squadron of his fleet sailed up Loch Long, crossed to Tarbet, and swooped down Loch Lomond, to the destruction of the unsuspecting Lennox. Tarbert on Loch Fyne was the scene of a similar exploit already mentioned, having been crossed by Magnus Barefoot of Norway seated in his galley, who thus secured for Norway the whole of Kintyre, a feat which was repeated also by Robert Bruce.

Loch Lomond used to be noted for three wonders: waves without wind, fish without fins, and a floating island. This last is somewhat rare, and consists of masses of ground-weed which have been torn from the shallow bottom by storms. The windless waves are common on all big sheets of water, and are indeed better seen on Loch Tay or Loch Earn, where there are no islands to obstruct them. They are of the nature of earthquake waves, commonly but wrongly called "tidal" waves; these were first observed on the Lake of Geneva, and have been studied on most of the Scottish lakes as well. The fish without fins are simply adders, which may be seen swimming from island to island, but it is not so commonly

known that Loch Lomond alone possesses the fresh-water herring, or "powans," as they are called locally. It is interesting to note that there is another fish which is peculiar to the south of Scotland, the vendace, found in the Castle Loch of Lochmaben. This fish is said to have been introduced from France in Queen Mary's reign, but its French relatives are now extinct, having been killed at the Revolution along with the owners of the fish-ponds.

At Inversnaid steamboat passengers from Balloch may disembark and proceed by road up the glen of the Arklet to Loch Arklet, now part of the Glasgow water-works, and over the hill to near the west end of Loch Katrine; a little steamer then conveys them to the Trossachs pier, whence they continue by road along Lochs Achray and Vennachar to Callander. Rowardennan is the pier from which to climb Ben Lomond, 3,192 feet high. The distance to the top is five miles by an easy road, and there, weather permitting, a splendid panorama awaits the traveller. Balloch, where the river Leven flows out of the loch, gets its name, a common one in Scotland, from the Gaelic *bealach*, a pass or gap. Glasgow has a fine park on the loch side, and this may be reached either by train or tram from the city.

The Gareloch

The Gareloch gets its name from the Gaelic adjective *gearr*, short; the name appears again in Loch Gair off Loch Fyne, and Gairloch in Ross. The loch is quite lowland in character, bordered by low and gently sloping hills; it is 7½ miles long, and only 30 fathoms deep at most. At the narrows, near Rhu, it is only a furlong wide, and the tide runs in and out at from three to four miles an hour. There is a measured mile on its western shore, opposite Rahane, where the speed of ships can be tested, but most ships prefer to use the other measured mile at Skelmorlie, as the Gareloch is too much of a dead end or backwater. For the same reason it is not now used so much as formerly for adjusting compasses,

and indeed has become of late years pretty much a dock for disused ships. The West Highland line from Craigendoran passes along the eastern shore of the Gareloch, and at its head climbs over a saddle 256 feet high, to Whistlefield and Loch Long, on its way to Arrochar. Rhu contains the grave of Henry Bell, whose monument is seen at Dunglass Castle, near Bowling.

Loch Long and Loch Goil

Loch Long is not so named because of its length, though it is 17 miles long; the name really means "Loch of the Ships." It is a long, narrow, Highland loch, varying in width from two miles down to three furlongs, and with a depth of 15 to 20 fathoms. At the Whistlefield saddle it is only two miles by road from the Gareloch, and at Arrochar only one and three-quarters from Tarbet, Loch Lomond. The little river valley at the head of the loch affords no thoroughfare, but on the west side, two miles from Arrochar, the wild Glen Croe pierces the hills, overlooked by the Cobbler and other Arrochar hills, over 3,000 feet high, and leads up to "Rest and be Thankful," 861 feet high, then down Glen Kinglass to Cairndhu near the head of Loch Fyne, and on to Inveraray. The upper portion of Loch Long is now used as a station for torpedo boats.

Loch Goil means the forked loch; it is not to be confounded with the "dark Lochgyle" of *Lord Ullin's Daughter*, which refers to a sea-loch in Mull. From Lochgoilhead a good road leads by Hell's Glen over to St. Catherine's on Loch Fyne, and this affords a mail route to Inveraray during winter, when the steamers are off. The rugged triangle of land between Loch Long and Loch Goil is ironically known as "The Duke of Argyll's Bowling Green"; Glasgow's Highland estate of Ardgoil, 14,740 acres, occupies part of this triangle, and may be reached by steamer from Greenock or Gourock to Lochgoilhead. Carrick Castle, a picturesque ruin on the western shore of the loch, dates from the fifteenth century, and was once a royal stronghold. Between three

and four miles south from the fork of the lochs is Ardentinny, famous in Tannahill's song, and here a road climbs up Glen Finart to Loch Eck, joining there the main road from Dunoon to Inveraray.

The Holy Loch

The Holy Loch is really a little bay two miles long by less than a mile broad, and is mainly known as a yachting centre, Hunter's Quay at its southern point being the headquarters of the Royal Clyde Yacht Club. Its name may have been got from the ancient church at Kilmun, but the popular explanation is more romantic, and reflects some credit upon the citizens of Glasgow for their sense of values even at an early date. When the cathedral was planned, nothing would serve the pious burghers, vassals of the bishop, but a foundation brought from Jerusalem itself, and accordingly a vessel was chartered, sailed to the Holy Land, and came back to the Clyde laden with sacred soil. But, alas! the vessel was sunk by a violent squall, and the precious cargo went to the bottom of this little loch, which thus rejoices in a borrowed sanctity. Kilmun, on the Holy Loch, a place of great antiquity, is the front door to the valley of Loch Eck, leading on to Strachur and Lochfyneside. The lower part of the valley forms the estate of Benmore, now handed over to the Government for a school of forestry. The splendid collection of trees here, like those at Stonefield and Inveraray, bears eloquent testimony to the climate of the Firth.

Round Toward Point the coast trends sharply northward up Loch Striven, another typical fiord, eight miles long by two broad, and with depths varying from 20 to 55 fathoms. The glen at its head leads nowhere, but a cross-road from Dunoon through Glen Lean touches the head of Loch Striven and passes on to Loch Ridden for Colintraive and Glendaruel.

LOOKING UP LOCH LONG.

(Photo: Valentine and Sons, Ltd.)

The Kyles of Bute

The Kyles of Bute get their name from the Gaelic *caol*, a strait, and form an elbow of sea round the north end of Bute. On the east, between Toward Point on the mainland and Bogany Point in Bute, the width is only two miles, but it suddenly expands into Rothesay Bay, with Loch Striven going off to the north. Between Strone and Ardmaleish Points the passage again narrows to about one mile, and at the bend the strait is almost blocked by the Burnt Isles, leaving narrow channels less than half a mile across, which demand careful steering when the tide is racing through. One of these islands has a vitrified fort, and on another, Eilean Dheirrig, the ill-fated Earl of Argyll tried to establish a magazine in connection with his futile rising. From the bend Loch Ridden, the most charming of all the lochs in the Firth, runs up for six miles past Ormidale pier to Glendaruel, along which a fair road leads to Strachur on Loch Fyne, while a steep hill road leads west to the same loch at Otter Ferry. The West Kyle turns south-west past the " Maids of Bute " and Tighnabruaich—" the house on the brae "—then south, ten miles in all, to Ardlamont Point, where it merges with Loch Fyne into the Sound of Bute.

Loch Fyne

Loch Fyne, famous for the quality of its herring, is the longest of the sea-lochs, 40 miles in length. Its lower portion widens out to four miles at Loch Gilp, but at the Otter Spit (Gaelic *oitir*, a bank of sand), a ridge of sand a mile long, it suddenly narrows to half a mile, and from that point to the head is only from one to two miles broad. The herring fishing is at its best in July and August, and lasts till February, but the best fishing now seems to be farther south in Kilbrannan Sound. Naturally, the villages on the shores of Loch Fyne are all fishing communities. Tarbert, on an isthmus little over a mile long, was an important strategic point in early Scottish history, and had three castles, one on West Loch

Tarbert, one on the isthmus itself, and the third, the only one now remaining, on the East Loch. The story of Magnus Barefoot's overland "sail" has already been told. The modern tourist, landing from the *Columba*, crosses by road to West Loch Tarbert, where he finds another steamer to take him down the loch for ten miles, and then out to sea for Gigha and Islay. A mail coach also runs in connection with the steamer down the west side of Kintyre, serving the coast villages and finishing its course at Campbeltown. Ardrishaig, at the broadest part of Loch Fyne, is at the entrance of the Crinan Canal, Scotland's smallest but most useful canal, which saves passengers from the long and stormy passage of 70 miles round the Mull, and forms the middle stage of the "Royal Route" from Glasgow to Oban and the Western Isles. Loch Gair, above the Otter, though very little known or used, is one of the best little natural harbours in the west. The villages in succession northwards are Minard, Crarae, and Furnace, the last two with granite quarries, then Strachur and St. Catherine's on the east side, and finally the county town of Inveraray. In summer there is a daily steamer service to Tarbert and Ardrishaig, and another to Minard, Crarae, Strachur, and Inveraray. The winter mails are carried by road from Lochgoilhead over Hell's Glen to St. Catherine's, and to Inveraray by ferry. There is no road up Glen Fyne or Glen Shira, but by Glen Aray a road leads over to Cladich, Loch Awe, and on to Dalmally. From Inveraray a road leads south along Loch Fyne to Tarbert, then down the west side of Kintyre to Campbeltown and Southend. The deepest part of upper Loch Fyne is between Strachur and Inveraray, 77 fathoms; at Inveraray it is 64, but only 6 at the Otter; the lower loch is 75 north of Tarbert, and no less than 104 off the Skate Island.

Kilbrannan Sound

Kilbrannan Sound, named after St. Brendan of Clonfert, Ireland, who visited the Western Isles in 545, is the long

channel between Kintyre and Arran. It is 27 miles long, from 3 to 15 miles broad, and much deeper in the middle than at either end, being 29 fathoms off Skipness, 89 off Pirnmill, 84 at the cable from Carradale to Arran, and only 21 between Campbeltown and Pladda. The Campbeltown steamers from Glasgow sail down the Sound daily, calling at Loch Ranza and Pirnmill in Arran, and Carradale and Saddell in Kintyre, and in summer the Campbeltown steamer from the railway termini at Craigendoran, Greenock, Gourock, Wemyss Bay and Fairlie, calls at Loch Ranza and Machrie Bay.

The Ayrshire Coast

The east side of the Firth, with its long stretch of a hundred miles from Greenock to Ballantrae, presents an entirely different aspect. Here we have an almost unbroken curve of coast-line, backed up by modest and for the most part retiring hills, beginning with the ridge of volcanic rocks which separates the shires of Renfrew and Ayr. This ridge reaches its highest points in Mistylaw (1,633 feet), and the Hill of Stake (1,711 feet); it slopes down steeply upon Greenock and Largs, and more gently to the east, draining into the Gryfe and the Black Cart, and among other things storing up water for Greenock in Loch Thom behind that town, and for Paisley in the big reservoir at Camphill, between Kilbirnie and Largs. Then comes the great fertile plain of Kyle, fringed by continuous golf links from West Kilbride to Ayr, and backed up by the rich farm lands of the Burns country, with the nearest hills twenty miles away on the Lanarkshire borders. Finally, at the Heads of Ayr, coast hills again appear from Brown Carrick (940 feet) all the way down to Loch Ryan. The rivers here are all considerable streams flowing west—the Rye, Garpal, Irvine, Ayr, Doon, Girvan, and Stinchar—most of them famous in song, and all their valleys forming lines of population and of traffic. Gourock, Wemyss Bay, and Fairlie piers serve the Upper Firth; Ardrossan is the port for Arran, the Isle of

Man, and Ireland, in addition to carrying on a coal export trade which it shares with Irvine, Troon, and Ayr. Off Skelmorlie is the measured mile (6,080 feet) used for testing the speed of ships; they generally make three or four runs with the tide and the same number against it, taking the average time, and very often finish up their trials by "running the lights," from the Cloch to the Little Cumbrae, a distance of 13 nautical miles, or nearly $15\frac{3}{4}$ statute miles. Note that the nautical mile is 6,080 feet instead of 5,280, and that a ship's speed is measured in knots, or so many nautical miles per hour; a "knot" is not a distance, but a rate of speed.

Although summer trips by steamer are run on the east side of the Firth to Ayr and even Stranraer, the regular traffic to this district goes by the railways, which give direct access to all the coast towns except Ballantrae; this is reached by road from Pinwherry station. The natural riches of this countryside were summed up in the old rhyme:

> "Kyle for a man, Carrick for a coo,
> Cunningham for butter and cheese,
> And Galloway for 'oo' (wool)."

Ayrshire has long been famous for its cows and dairy farms, but of recent years the extensive working of the coalfields has threatened that pastoral scene with conversion into a "black country." This has its compensations in the export of coal from the ports already mentioned and the stimulation of shipbuilding at these centres, although in this trade the amount of work is very small compared with that on the river Clyde itself from Greenock to Glasgow. In this industry special mention must be made of such pre-eminent yacht-builders as Fife and Watson.

As the Clyde is the chief centre of the British shipbuilding industry, and is, moreover, the main approach to the other great industrial centres of Scotland, its defence in time of war is a matter of the first importance. Apart from special defences such as booms and minefields, which were laid down

during the Great War, three permanent defences exist. These are the Ardhallow Fort between Innellan and Dunoon, the Portkill Fort above Kilcreggan, and a minefield connecting the latter with Fort Matilda in the west of Greenock. There is also a guardship at the Tail of the Bank, and a torpedo station in Loch Long.

Bute, Arran, and the Cumbraes

Bute, Arran, and the Cumbraes are combined to form the county of Bute. The Little Cumbrae is a rocky islet containing nothing but a ruined watch-tower, a farmhouse, and on its western cliffs a lighthouse. The Big Cumbrae, with Millport, and Bute, with Rothesay, Port Bannatyne, and Kilchattan Bay, are favourite summer resorts. Rothesay in particular, "The Madeira of the North," has special attractions in its mild climate and equable temperature, in which it rivals Torquay, much farther south. These two islands are reached by steamer from the Broomielaw or the railway piers, but most rapidly by Wemyss Bay, which route brings Rothesay within ninety minutes of Glasgow.

Arran is in a class by itself, presenting on the threshold of a complex modern civilization an unspoiled piece of nature such as makes the very essence of a holiday. There are no railways, nor even a tramway, as in Bute ; there are few roads, and those only of the second or third class, and it is only in recent years that any motor cars, except the doctor's, have been allowed on the island. Corrie, Brodick, Lamlash, and Whiting Bay on the east side, and Loch Ranza on the north-west, are fairly modern villages, but the real Arran is seen in the little clachans, originally farm-touns, which abound between Whiting Bay and Loch Ranza by the south end. Though the conditions of life there are still somewhat primitive, the essence of a holiday, after all, is a complete change. There are no amusements (save the mark!), no pierrots, minstrels, or jazz bands, but there is complete liberty. In England the wayfarer who strays from the road is a trespasser, but in

Scotland there is no law of trespass. Decent people will always close all gates behind them and avoid trampling on the crops or disturbing the animals, tame or wild; but over the greater part of Arran there are neither gates nor fences, and no animals to disturb but grouse and deer. While the south end of Arran is Highland, the north is Alpine; many of its cliffs require the rope, and climbers of all classes will find plenty of scope on Goatfell, Cir Mhor, the Castles, and the other lofty hills which cluster round the Saddle. The early history of the island is Norse, though Holy Isle and Kildonan commemorate the earlier missionaries of the sixth century. It was in Lamlash Bay that Haco marshalled his fleet before his defeat at Largs; in the cave at Drumadoon, near Blackwaterfoot, Bruce observed the historic spider; from King's Cross on the east side he was led over to Turnberry by an accidental fire, to begin the war which ended at Bannockburn. Efforts are sometimes made to induce the proprietor to open up the island for feuing, but while there is plenty of building-ground on the Firth, there is only one Arran.

Chapter XVIII

POSTSCRIPT

Looking Backward

WHAT is to be the future of the Clyde area? There are certain places which by reason of natural advantages, such as geographical position, must always be places of cardinal importance. Palestine, for example, at the meeting-place of three continents, is evidently predestined to be an international world-centre, and such ports as Constantinople, Gibraltar, and Panama must always remain of first-rate importance on trade routes. What are the advantages which gave Glasgow and the Clydeside towns the premier position in Scotland which they hold to-day? Our survey has shown that their natural advantages were few.

In prehistoric times, as we have seen, a small settlement of hunters and fishers was established on a ridge above the extended Firth, just at the point where the Clyde could be most easily forded, with abundant supplies of fish in front of them and limitless forests for hunting and woodcraft behind them. As the river contracted to near its present width, the ford was replaced by a stone bridge, and the bishop-patrons of the little fishing community, taking a high view of their duties as overseers, fostered their vassals, procured for them royal privileges, catered for the mind and soul as well as the body, and set up churches, schools, and a university.

In 1707 the Union gave certain enterprising young men of Glasgow the opportunity of their lives, and they took it, establishing the great American trade in tobacco, then in

cotton, and then in sugar. At the same time the interests of the community as a whole made them take the Clyde seriously in hand, and by converting it into a ship canal they made Glasgow the first port in Scotland and the fifth or sixth in the United Kingdom.

A hundred years later Glasgow had discovered its outstanding natural asset, its position on the great Lanarkshire coalfield, and at the same time the genius of such men as James Watt, Symington and Bell, the Napiers, and David Dale, harnessed the ancient stores of coal to the newly-perfected steam-engine, and made steam the leading source of power in industry. Now steam as a direct motive-power is being replaced by electricity, the energy of which is derived mostly from steam, but also from water-power, and again the community as a whole have been led and guided by men of genius and resource. Towns and townlets have sprung up like mushrooms all over the industrial belt, whose very existence is based on coal: the coal is running done, and after coal—what?

Looking Forward

Sir Halford Mackinder, our leading expert in economic geography, is not afraid to face the issue when he says that places like Glasgow, Manchester, and London owe their greatness to-day mainly to momentum from the past. The material advantages of the Clyde are long past, or are passing rapidly, and the future of the district will depend more and more on the non-material assets or capital—the mental and spiritual capital, the character of its inhabitants. If the Scottish virtues are maintained and developed—foresight and energy, perseverance and thrift, coupled with that idealism which the genuine Scot has never lost, and which is enshrined in the noble answer to the first question of the Shorter Catechism, "What is man's chief end?"—then there is no fear of the momentum or driving-power being lost: it will rather increase at an increasing rate and carry all before it.

The growth of the future, however, is rooted in the past. History proves that a civilization founded on a materialistic view of life is foredoomed to failure. It was the cult of sensual pleasures that ruined ancient Carthage and her mother Tyre, each in her day the mistress of the seas; the "glory that was Greece and the grandeur that was Rome" alike perished because their heart was set on the things of earth. The Clydeside men must learn, as wise men have always learned, from the experience of others, that it is righteousness that exalteth a nation, and that the real capital of a community—and all men are capitalists—consists in the personal character of its members. Many have thought that the best form of government would be a benevolent despotism; the trouble has always been to find a despot who, with the possession of absolute power, remained benevolent. A wise statesman has said that self-government is better than good government, and in a sense that is true; but the only reason why self-government is not also good government is that we do not trouble to make it so. For good or evil we are committed to democracy, "government of the people for the people by the people," but an unintelligent democracy is the very worst form of government. "We must educate our masters," said Disraeli, when the franchise was extended to householders. It cannot be said that the process of education has yet been completed, or that our votes on local and imperial matters always show an intelligent grasp of the questions we have to solve, or a clear understanding of what is best for our country. Our most certain guide to its future welfare will be a thorough knowledge of its past. There is no short road to the millennium. Many have proclaimed that they had found one, but it always turned out to have a quite different terminus.

However much our circumstances have changed from those of Glasgow's earliest settlers, our social life and conduct, if it is to be worthy, must have the same foundation—the brotherhood of man—and must fulfil the duties which that implies; our duties and not our rights must stand first among our

motives to action. But the brotherhood of man can only be fully realized when it is based upon the Fatherhood of God; then, and not till then, will Glasgow become what Jocelyn meant when he called it *Cara Familia*, the "beloved community;" and only then will St. Kentigern's prayer be fully answered: "Lord, let Glasgow flourish by the preaching of Thy Word and the praising of Thy Name."

THE END

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